IMPLEMENTATION OF THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

HEARING

BEFORE THE

SUBCOMMITTEE ON
ENERGY AND MINERAL RESOURCES
OF THE
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
NINETY-SEVENTH CONGRESS
FIRST SESSION
ON
THE IMPLEMENTATION OF THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

RICHLANDS, VA., SEPTEMBER 2, 1981

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IMPLEMENTATION OF THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

WEDNESDAY, SEPTEMBER 2, 1981

U.S. Senate,
Subcommittee on Energy and Mineral Resources,
Committee on Energy and Natural Resources,
Richlands, Va.

The subcommittee met, pursuant to notice, at 10:10 a.m., at the Southwest Virginia Community College, Richlands, Va., Hon. John W. Warner presiding.

Present: Senator Warner and Congressman Wampler.

Also present: Roger Sindelar, counsel; D. Michael Harvey, chief counsel for the minority; and Ronald L. Andes, science fellow.

OPENING STATEMENT OF HON. JOHN W. WARNER, A U.S. SENATOR FROM THE STATE OF VIRGINIA

Senator Warner. Ladies and gentlemen, we will get underway. I am sorry we are just a few minutes late. I went out to speak to the people who are picketing. They are picketing for the very purpose we are here today, mainly asking the Federal Government to do what we can to change the regulations so that they can go back to work and mine the coal that is so desperately needed for America's energy crisis, coal that is needed for export to help America's balance of payments, and do that mining in a way that is compatible with preserving the environment that we all love so much.

I think this is the first time in living memory of anyone that a U.S. Senate subcommittee has held a hearing here in southwest Virginia and we are looking forward to this opportunity to be in the field.

We have with us today, Mr. Wampler, the senior member in the Virginia congressional delegation.

Mr. Wampler, do you recall of a Senate hearing being held here in your long tenure as a Member of Congress?

Mr. Wampler. No, sir, I don't.

Senator Warner. As you know, Congressman Wampler and I work in partnership on just about everything. It so happens that I am on the Energy Committee, as chairman of the Subcommittee on Energy and Mineral Resources, that has a direct responsibility for mining coal in America. And I am pleased this morning to have this hearing. I am very pleased with the large number of witnesses who are going to testify. I want to make it clear that this testimony will be made a part of the official record of the Committee on Energy and Natural Resources of the U.S. Senate and it will be used by the Senate in connection with its review of the 1977 act to determine whether there is any need for new legislation.

At the present time the Congress is not endeavoring to amend the 1977 act. Twice before this administration, I, together with other Senators, initiated amendments to the act, and they were passed both times in the U.S. Senate, but blocked in the House of Representatives. The President, President Reagan, the new Secretary of the Interior and our leadoff witness today, the Director of Office of Surface Mining, have all come before the Congress and asked that we not take any initiatives to amend the 1977 act at this time, in order to give President Reagan a chance, working with the Secretary of the Interior and Director of the Office of Surface Mining, to apply the regulations consistent with the original intent of Congress.

Thus far I am content we are making progress. Thirty-three new regulations are presently out for comment all across America. Two additional regulations will be issued shortly. That will be the initial body of regulatory reforms that hopefully will be approved and in place by the end of this year, this calendar year, such that the miners, the operators, the environmentalists, the conservationists, civic and community leaders will know with more precision exactly how surface coal can be mined in a manner that is compatible with the environment.

I invited these gents, who turned out early this morning, to come and join the hearing. I am pleased to see that they are stepping in to join us here, so they can hear for themselves the efforts being made by this administration to revise the regulations so that they can go back to work.

I am joined this morning by my dear friend and good colleague, Congressman Wampler. We also have the counsel for the Subcommittee on Energy and Mineral Resources, Mr. Sindelar, and we have Mr. Harvey, who is counself or the minority on the Senate Committee on Energy and Natural Resources.

[The prepared statement of Senator Warner follows:]

JOHN W. WARNER
VIRGINIA

United States Senate
WASHINGTON, D.C. 20510

ARMED SERVICES COMMITTEE
Chairman, Strategic and Theater Nuclear Forces
Subcommittee
ENERGY AND NATURAL RESOURCES COMMITTEE
Chairman, Energy and Mineral Resources
Subcommittee
RULES AND ADMINISTRATION COMMITTEE
JOINT COMMITTEE ON PRINTING
REPUBLICAN SENATORIAL COMMITTEE

Statement of

SENATOR JOHN W. WARNER OF VIRGINIA

CHAIRMAN, SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

UNITED STATES SENATE

IMPLEMENTATION OF THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

Oversight Hearing
Russell Building Auditorium
Southwest Virginia Community College
Richlands, Virginia
September 2, 1981

FOR RELEASE: On Delivery (10:00 a.m.)

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Good morning, ladies and gentlemen. The hearing will come to order.

As Chairman, it is my pleasure to welcome you to this official hearing of the Subcommittee on Energy and Mineral Resources of the United States Senate. This Subcommittee has overall responsibility for legislation relating to production and utilization of coal in America in an environmentally compatible manner.

This is the first in a series of regional field hearings nationwide on the oversight of the Surface Mining Control and Reclamation Act of 1977. Such hearings allow for the broadest input by the public and private sectors on important issues without those parties incurring enormous expense in time and money to travel to Washington, D.C.

The proceeding today is called an oversight hearing. That means no specific piece of proposed legislation is being considered. Rather the hearing will focus on how well surface mining is working, or not working, under existing law.

It has been two years since the Energy Committee exercised oversight authority to review the Surface Mining Act and its implementation. Since then much has transpired -- administratively, legislatively, legally, publicly and privately -- with regard to the surface coal mining industry and the regulations issued under the Surface Mining Act of 1977. These events call for this Senate committee's close examination.

The Surface Mining Act was designed to foster an economically viable coal industry sensitive to environmental concerns and public safety.

Coal is being looked to more and more -- not only by the United States but the nations of the world -- as one of the main energy substitutes for high priced oil.

Coal buying delegations from the coal importing nations of the world in meetings held with me have emphatically stated that they are looking to America's coal -- whether mined from deep or surface mines -- to provide the energy security they desperately seek.

Recognizing that energy-secure nations of the world require less economic and military assistance from the United States, I have represented to these nations that I would work in the Congress to provide them America's coal.

It is the responsibility of this subcommittee to see that America's coal is mined to meet energy requirements, to compete in the world market, and to see that such coal is mined in an environmentally acceptable manner.

(MORE)

During the 96th Congress (1979-1980), the Surface Mining Act was amended in the Senate -- and I stress amended, because the interpretation accorded it by the Office of Surface Mining in many areas was directly contrary to Congress' stated intent. I supported this amendment which was blocked by the House of Representatives.

This year, Congress was asked not to consider amendments to the Surface Mining Act until the new Administration has an opportunity to review the Act and its regulations. The Administration is endeavoring to rectify the regulatory problems without the enactment of amending legislation.

We are here today -- as concerned citizens, and representatives of those who have a stake in this matter. The problem we will be discussing is dual in nature. It is one of insuring economic development in our coal producing regions, as well as one of protecting the environment for an appropriate post-mining land use.

We have a number of witnesses and panels coming before us today. I ask all of the witnesses to summarize the salient points of their testimony. The entire written statement will be printed in the hearing record. Those wishing copies of the printed record should write their names and addresses on the list on the table by the sign. You will be sent a copy in a month or six weeks.

The hearing record will remain open for two weeks after today for additional written statements. They can be sent to the Senate Energy and Natural Resources Committee, 3104 Dirksen Senate Office Building, Washington, D.C. 20510, Attention: Roger Sindelar.

In closing, as we begin this hearing, let me say that I am very encouraged by the cross section of witnesses here today. Further, I would like to say that it will take more than rhetoric to initiate legislative changes. We will need strong justification prior to undertaking any new legislative actions.

# # #

Senator **Warner**. At this time I would like to invite my colleague, Congressman Wampler, to say a few words.

STATEMENT OF HON. WILLIAM C. WAMPLER, A U.S. REPRESENTATIVE FROM THE STATE OF VIRGINIA

Mr. **Wampler**. Thank you, Senator Warner.

I know I speak on behalf of everyone here this morning and, indeed, all southwest Virginians to say thank you for coming here and for conducting this hearing.

I want to thank Dr. King and the staff of the faculty here at Southwest Virginia Community College for having us here. This is but one more indication of their involvement in so many good things that affect southwest Virginia.

I want to concur in what Senator Warner had to say about the development of legislation, and hopefully the prospect for some meaningful reform and the regulations affecting the coal industry.

I recently returned from a 12-day visit to Europe, along with members of the Committee on Agriculture, on which I serve. The purpose of our trip was to try to develop new markets for agriculture exports, something that is very vital for the survival of agriculture in this country, and probably be one of the most effective things that we could do to fight inflation, to try to bring some balance into our payments in trade with other nations.

During that visit I also discussed the possibility of development of additional export markets for coal. I am particularly happy to say in two of the six countries that we visited, in Denmark and Spain, there was an expression of strong support for additional coal export from the United States.

One of the concerns raised was the difficulty that we are having in Hampton Roads in our export facilities. I readily acknowledged that we are having problems. We are trying in the Congress to pass legislation which would permit us to deepen the channel, the main channel there in Hampton Roads, so we could accommodate the larger ships that would haul the coal. Some of those problems are short term, some of them are long term.

I am happy to say that the Government and coal industry and the transportation industry is recognizing those problems and are now beginning to develop a plan of action which hopefully will permit us to develop this potential export market. It is interesting to note, in most of the countries of Western Europe especially, wherever possible, they are converting from oil and gas to coal fired steam generating facilities and other industrial uses, something that this country should have done many years ago. Hopefully we will see more initiative in that regard.

As far as the 1977 act is concerned, as most of you know, I actively opposed that legislation because I felt it was legislation that went too far in terms that it has had a serious economic impact in surface mining here in Virginia and elsewhere.

I think we all recognize that some regulation is inevitable. Some is desirable, but on the other hand, there has to be some reasonable cost benefit assessment and I happen to believe that we can conduct surface mining and do it in a way that is responsible and in a way that will permit us to reclaim the land, and in many cases will have far more productive land with a higher economic use after the mining has ceased than was the case before.

Again, as one who has more than a passing interest in agriculture, I am concerned that we must look ahead 50, 100, 150, 200 years to decide and make the decision of where is the land going to come from that will produce the food and fiber that will be needed, not only to feed our people, but to help feed people throughout the world.

So I am anxious, Senator Warner, to hear what the witnesses have to say this morning. I came here to learn, and I have always observed that when one is silent and listens, he can learn more than when he talks, but I appreciate so much this opportunity to be heard, and thank you again for having this hearing here this morning.

Senator WARNER. Thank you, Congressman Wampler, for those remarks—particularly being silent. My wife reminds me of that periodically. [Laughter.]

Before we proceed with our first witness, I wonder if Dr. King, president of Southwest Virginia Community College, would rise. Thank you very much, Dr. King, for your and your staff's assistance in facilitating this hearing. [Applause.]

We have had many meetings on coal here, which illustrates the college's service to the community.

Mr. Harvey, do you have any comments?

Mr. HARVEY. No, sir.

Senator WARNER. Mr. Sindelar?

Mr. SINDELAR. No, sir.

Senator WARNER. We will proceed right away with our first witness. One member of the witnesses is flying in, Mr. Gillman, but we will start off with Mr. Harris, who is the Director of the Office of Surface Mining. He will be accompanied by Dean Hunt, Assistant Director of Technical Services, U.S. Department of Interior.

By way of introduction, Mr. Harris is a former legislator from the State of Indiana. He is thoroughly familiar with the legislative process, not only at the State level, but at the Federal level. He brings a long and distinguished record of public service and active work in the area of mining to Washington, D.C. He may bear the label bureaucrat, but he is one of the most experienced and best informed that we have had there in a long time. He is the personal choice of the President of the United States to come to Washington and to try and redirect regulatory reforms so as to be fair and equitable to the States, and not only that, but to the environment.

Yesterday we took a helicopter tour of the coal mining region and we bounced in and out of thunderstorms for 4½ hours, and we saw a considerable part of southwest Virginia and a full range of the mining operations, together with good examples of how reclamation has been performed and performed in a manner that enables the land to be retured to a second use by the people who live in this part of Virginia.

Thank you, Mr. Harris, for joining us. You may lead off.

STATEMENT OF JAMES R. HARRIS, DIRECTOR, OFFICE OF SURFACE MINING; ACCOMPANIED BY DEAN HUNT, ASSISTANT DIRECTOR, TECHNICAL SERVICES, DEPARTMENT OF THE INTERIOR

Mr. HARRIS. Mr. Chairman, we at the Office of Surface Mining consider it a privilege to be allowed to appear here today to explain this administration's approach to enforcement of the provisions of Public Law 95–87.

Senator, under my direction, State primacy will be a central theme guiding the direction of the OSM over the coming years. We must acknowledge that it is the States that will be working with the public and mine operators on a direct day-to-day basis and it is through their administration and enforcement of the program that meaningful reclamation in the field will be provided.

Notwithstanding, the Office of Surface Mining will continue to have an important role in assuring the protection of the Nation's environmental resources. We will provide regulations, guidelines, and handbooks establishing minimum national standards and good engineering practices for mined land reclamation. We will work with the States in improving their administration and enforcement programs through direct technical assistance, through grants-in-aid, and through management and policy direction and advice. We will conduct a vigorous oversight program, geared toward working cooperatively with the State regulatory authorities to assure that they have the capabilities, and are in fact carrying out the mandate and responsibilities of the program.

This approach recognizes the basic framework established under the Surface Mining Control and Reclamation Act. A framework that consists of an interim regulatory program with dual State and Federal enforcement and a permanent regulatory program with primary jurisdiction resting with the States. I support this approach and we will work toward the goal of making the surface coal mining regulatory program a model of how the States and the Federal Government can work together to accomplish a mutual goal. I believe it makes programmatic and economic sense to plan now to effectively administer the program over the long term.

The first major step in this direction is the reorganization of the Office of Surface Mining. Over the past several years the States and industry have voiced concern over the burdensome and redundant structural policymaking process in the Office of Surface Mining and the difficulty in obtaining coordinated policy decisions. Under the reorganization, we will increase our capacity for carrying out our responsibilities under the permanent program in two regards: First, we will create two tehchnical centers to respond to the States' technical creation of 13 State liaison offices and 6 field offices with responsibility for dealing directly with the States in inspection oversight, grants-in-aid and grants for reclamation of abandoned mined land; and, second, we will crete two technical centers to respond to the States' technical needs, provide assistance to small operators, carry out Federal reclamation projects on abandoned mined land, and oversee the process of premining review. While major policy directions and decisions will continue to be made out of the Washington headquarters office, the new organization will give us a better ability to respond to our day-to-day programmatic responsibilities and develop the sophisticated technical expertise necessary to handle persistent problems with mined land reclamation.

As part of this reorganization we are proposing to maintain OSM State liaison offices in Charleston, W. Va., and Knoxville, Tenn.; open up new OSM State liaison offices in Big Stone Gap, Va., and Lexington, Ky.; maintain field offices in Beckley and Morgantown, W. Va., and London, Ky., and provide a central technical services center in Pittsburgh, Pa., to handle the unique mining problems of the steep sloped Appalachian coal province. In total we will station nearly 200 OSM employees and inspectors in these offices to assure proper execution of the regulatory requirements, to provide assistance to the States in their administration of the program, and to provide for the reclamation of abandoned mined lands. Senator, we can no longer treat the mining industry of this region as an ugly stepchild. If this Nation is to regain a strong economic and industrial base, and relieve it of the burden of being held hostage to foreign energy supplies, it absolutely essential that we produce coal at the lowest possible cost, in keeping with sound environmental practices. This goal is particularly important throughout Appalachia where much of the economy of the region is based on the production of coal. The decline in the economic base of all of our Appalachian communities, during the 1950's and 1960's as the Nation looked to oil and natural gas as its primary fuel resource, is historic.

My goal, Senator, is to provide a solid framework for the development of a sound and viable coal industry over the years ahead. Throughout this process, however, we must recognize that mining is a temporary use of the land and we must be constantly vigilant of the need to return mined areas to their premining conditions, or to higher and better land uses and to protect our hydrologic and other environmental resources.

In my recent helicopter tours of this region I have had an opportunity to observe the most striking natural feature of this area—that is, its rugged steep sloped topographic relief. A recent study completed for the Virginia Division of Mined Land Reclamation has indicated that as much as 95 percent of Virginia's strippable reserves are located on slopes in excess of 20 degrees. However, even under these difficult mining conditions, I can assure you that the act is beginning to work and through the efforts of the State regulatory agencies we are seeing real progress in meeting the act's objectives.

We still, however, have some problems. Many of these are posed by the overburdensome Federal regulatory structure that has prevented the States from developing, in many instances, regulations appropriate for regional, local, and site-specific conditions. Obviously, detailed designed standards applicable to the large area mines in the West have little relation to the critical design considerations for contour and mountaintop mining operations in Appalachia. In speaking with the coal industry and the States, I am convinced that they are not opposed to the objectives of the regulatory program; rather, it is the non-cost-effective means of achieving those results that are frequently dictated by regulation and the absurdities in site-specific application of those standards that is costing the program its credibility and effectiveness. Under my direction, the OSM is currently proceeding with the reform of the Federal regulations for surface coal mining and reclamation. This process is structured around the broad goals of (1) increasing the State's role and responsibility in the regulation of surface coal mining and reclamation operations; (2) providing a framework for increased coal production to maintain the Nation's energy supply; and (3) performing the agency's responsibility to provide a national framework for the protection of the environment from the adverse effects of coal mining.

In reviewing and rewriting the agency's regulations, I recognize that the "meat ax" approach is not the answer. I want the regulations to be examined carefully, with full input from Members of Congress, the public and the States. Although the Surface Mining Act may not be a perfect piece of legislation, it is my opinion that basically it is a workable law and we must look to the overburdensome Federal regulations which have caused the geratest difficulties for the coal industry. Through our regulatory reform effort and working cooperatively with the States, we are moving toward correcting these problems and providing a sound framework for proceeding with the environmentally sound development of the Nation's coal resource.

I have proposed to begin the regulatory reform effort by opening the "State window" and stating through regulation that an alternative State method of providing for environmental protection is acceptable provided the State provision is "as effective as" the Federal law and regulations. Some question the "as effective as" provision and question why it is not stated as "as stringent as." As I have stated before, and I submit to you now, the measure of a good rule is not its stringency but its effectiveness.

We are also moving forward with regulatory relief in other areas of the regulations which are important to mining in Appalachia. Tomorrow will be the close of the public comment period on a rulemaking to provide additional flexibility in our regulations for sedimentation ponds. Previous overdetailed design standards for sedimentation pond construction were almost uniformly rejected by the Federal courts. Our new rules seek to remedy this problem and provide a meaningful but more effective performance standard. Additionally, we want to bring our rules in line with the proposed revisions to the U.S. Environmental Protection Agency's effluent limitations for coal mining point sources.

Other portions of the Federal regulations dealing with the hydrologic balance are also receiving close scrutiny in this process. The existing rules were almost uniformly found to be confusing and difficult to apply to Appalachian conditions. Frequently they seemed to ignore the fact that the primary pathway of groundwaters is in fractured rock strata rather than the better defined interbedded aquifers frequently found in other parts of the country. Our new draft regulation recognizes that diverse hydrologic conditions exist in different regions of the country and, rather than attempting to provide inflexible requirements that must be applied to all areas of the country, it proposes to install a workable framework creating a chain of information beginning with premine investigations and proceeding through mine design and assessment of the probable hydrologic consequences of mining, to monitoring operations during mining.

Because of the unique characteristics of contour and mountaintop mining operations, another set of standards of major importance in Appalachian areas are those relating to the disposal of excess spoil. Last week I received a study, requested by the previous administration and completed by the National Academy of Science, National Research Council, which reviewed the regulatory requirements for disposal of excess spoil. The report states, among other things, that the previous regulations "failed to take advantage of many decades of experience in civil engineering procedures and methods that are relevant to the design of fills of excess spoil." The report further recommends that "a regulatory approach be adopted that is goal oriented, adopts certain minimum mandatory performance standards, suggests nonmandatory guidelines, and encourages technological innovation." I have brought along a complete copy of this report, which I would like to submit for the record.* When we began the rewriting of this section of the regulations, we were not privy to what the NAS study would contain. It is very gratifying to find that their recommendations closely parallel what we had tentatively proposed in our rulemaking process effort.

We are endeavoring to proceed along these lines in our regulatory reform effort. Recent drafts of revised regulations for excess spoil disposal still establish minimum goals to be achieved, yet they leave sufficient flexibility for the engineer and operator to design and construct a cost effective, yet environmentally sound, fill.

Where necessary, certain design criteria will be retained. However, in general, I prefer to allow flexibility in the regulations such that the determination as to the type of fill and specific design and construction criteria are left to the registered professional engineer. The importance of proper certification of all phases of design and construction will accordingly be emphasized.

We have also taken steps to encourage the disposal of excess spoil on abandoned mine benches. A proposed rule providing special standards for such operations was published on July 20, 1981. This rule could have a significant impact throughout the Appalachian area and should provide better environmental protection of areas otherwise undisturbed by mining, advance the reclamation of our abandoned mined lands, and result in a cost savings to the mining industry.

One of the more controversial aspects of the Surface Mining Act is the requirement to return mined land to the approximate original contour and to completely eliminate highwalls created by mining. Again we are moving forward within our existing statutory authority. Through our Applied Research Branch we have initiated studies in the area of rock highwall stability so that we can better assess environmental conditions associated with such structuress; we are developing a new rule and a technical policy statement establishing standards for highwall reclamation when new mining operations consist of remining abandoned mined land areas; and finally, we have recently received our first application for an experimental practice requesting approval of higher and better land use, but which requires a variance from the standards for complete elimination of the highwall.

Thus, as you can see, we are proceeding through a variety of methods concurrently to achieve the goals of our regulatory reform effort and to lessen the unnecessary burden on industry while maintaining the protection of our environmental resources. We will not be able to fully determine the success of this effort for approximately a year. At the end of that time we expect to be able to better formulate recommendations to you with respect to any changes that may be appropriate in the act itself.

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*See appendix I.

In addition to providing flexibility where appropriate, I am moving to close those loopholes that do exist. Past abuses, of the 2-acre exemption contained in section 528(2) of the act, have resulted in uncontrolled damage to the environment and have cost the program a great deal of credibility. I have recently been involved in an extensive review of all aspects of this difficult problem. Clearly there is no simple solution.

I want to develop a rule that will eliminate future abuses, while maintaining the window for legitimate 2-acre operations which Congress intended to be covered by the exemption.

The previous rule, which was withdrawn on August 10, 1981, was in my opinion flawed beyond the point of simple correction. The rule was a last minute effort by the previous administration to resolve this difficult issue. However, the rule that resulted was sweeping in effect and ambiguous in application. It would have ruled that any 2-acre operations in the same State by the same operator, principal, or permittee had to be aggregated for purposes of calculating the 2-acre exemption. Thus, if there was one 1½ acre operation in eastern Kentucky, and another in western Kentucky 200 miles away, they would be considered to be a single operation for purposes of the 2-acre exemption. On the other hand two similar operations located less than a quarter mile apart near the Kentucky-West Virginia border would be considered separate operations. Further, the rule was limited to yearly increments, so that if a 2-acre operator closed one operation in May he would have to wait until the following calendar year to request an exemption for a new operation. The rule provided that the operator could affirmatively demonstrate that two sites were not related; however, it failed to set any standard or definition against which such demonstration would be judged or to provide guidance to the operator on what evidence might be sufficient. By a strict reading of the language of the previous regulation, the only demonstration allowable would be that the operations were in different States or during different calendar years.

A number of other flaws appear patent within the rule. A special definition is provided for what constitutes an affected area, without any supporting basis for why a 2-acre operation should be treated differently than other types of mining operations when defining the area affected by mining; the rule arbitrarily defines any land or water which is located above underground mine workings as surface area that is "affected" without looking at actual anticipated surface impacts; the rule tends to indicate that two or more sites with coal owned by the same person is grounds for denying the exemption, where most small commercial operators are unlikely to own their own coal; and the rule fails to resolve the difficult issues that the administrative law courts have been faced with in terms of mine support facilities and use of public roads.

On balance, it is my opinion that the previous rule would not have resulted in effective termination of the past abuses of the 2-acre exemption. I sincerely wish that this were not so and the action of withdrawing the rule had not been necessary. However, we are faced with the probability of expending considerable legal and technical resources in defense of a rule that we ourselves have been forced to question. The pending litigation and subsequent efforts necessary to have the rule included in State regulatory programs would have almost certainly held up application of the rule for months. In my opinion, we can better serve the mining and environmental communities by using the time to develop a new regulation which can serve as a permanent standard against which the States can develop their own regulatory programs. I have instructed my staff to develop option papers fully exploring the various options and the technical, legal, and enforcement problems that may be associated with each potential course. Within the next few months these will be on my desk and I will be able to propose a new rule that I trust will serve as a sound basis for evaluation of the exemption as it may apply to individual operators. In proposing this rule and finally adopting it I want to move forward with a sound rule that will effectively eliminate abuses, while withstanding legal challenge. I seek your support in this effort. As soon as I have a new proposal available I will be sending you a copy for consideration.

I would like to take 1 last minute to mention our work with the abandoned mined land reclamation program. No area of the country will be more significantly affected by the success or failure of this important program than Appalachia.

This country resolved 4 years ago to reclaim as much of the preexisting problems as possible and to prevent similar problems from developing in the future. Yet, we still have $461 million sitting in the Treasury while we debate overburdensome Federal regulations and State primacy. Actual reclamation efforts have lagged and it is my goal to assure that there is meaningful progress made over the next several years toward executing a coordinated program to reclaim these abandoned mined lands.

The first block of abandoned mined land AML grant to a State was in the amount of $2.23 million to the State of West Virginia, announced by Secretary Watt about 2 weeks ago.

I fully expect each Appalachian State to achieve primacy within the next 6 months. Maryland and West Virginia already have approved permanent regulatory programs, and upon the termination of injunctions in these States can proceed with the further development and implementation of their abandoned mined land reclamation programs. Virginia submitted its permanent program on August 31; and I expect Tennessee's program by mid-September, and Kentucky's program by the beginning of November. This will allow us to begin to transfer more abandoned mine land reclamation funds to the States to carry out State reclamation programs. These States are prepared and are, in fact, anxious to accept this responsibility. Over the past few years we have seen numerous stopgap efforts to fill the void created by confusion and delays in implementation of this program. Some positive strides have been made, but for the most part the effort has been disjointed and marginally effective. We are just in the process of completing three major steps in the development of a nationally coordinated AML response effort: First, as noted, we are working with the States to get State programs approved so that those individuals closest to the problems can set their priorities and assure the cost effectiveness of reclamation under the program. Second, we are in the process of finalizing a series of handbooks and manuals giving detailed technical guidance to the States, the industry, and others in the art of abandoned mined land reclamation. Finally, we are in the process of completing a national inventory of abandoned mine lands which will allow us, in working with the States, to set priorities for reclamation projects and to assure that the more significant problems receive first consideration. Working from this framework, the Office of Surface Mining will be able to assure the greatest benefit for each tax dollar spent on mined land reclamation and minimize the development of abandoned mined land emergencies.

Senator, I appreciate this opportunity to appear before you and discuss the implementation of the Surface Mining Act in Appalachia. I am very positive about OSM's future. I believe we can and must resolve the immediate issues facing us and get on with the job of mining coal and reclaiming mined land in an environmentally acceptable and an economically competitive manner. I stand prepared to work with you and the Appalachian mining and environmental communities over the next weeks and months ahead and look forward to establishing a relationship of mutual respect and consultation.

Senator **WARNER.** We thank you, sir. Would you be kind enough to introduce your distinguished colleague who has quite a reputation in the mining industry. He was formerly with the D'Appolonia Consulting Engineers, mining consultant firm in Pittsburgh, for 6 years. And he has trained both as an engineer and as a lawyer to help him development these regulations such as they can be in conformity with the act of 1977, and hopefully withstand court review.

Would you like to make any comments?

Mr. **HARRIS.** Senator, I would like to say that probably one of the best moves that I have made since I was originally chosen for this job was the hiring of Dean Hunt, who is with me today. I mentioned in the statement that I made that I think that we should simplify the regulations, and I have said many times in the past that I don't think a person should have to be double trained in the law and in engineering in order to understand and carry out his obligations under the act. Mr. Hunt has exactly that double training. He is able to first off bring good mining consulting background to the agency, along with a legal background which gives him the distinct advantage of not only being able to draft good sound regulations, but then be can argue with the lawyers after he gets them drafted, you see.

I brought Mr. Hunt with me to handle any technical questions that might not be something that I had a handle on at this time.

Along with the other people that we have brought into the agency, a small number have been able to change the direction of the regulatory program and to bring the agency around to the point that I think the people in the field today are well aware of the fact that we are attempting to be of assistance, as well as to regulate their industry. Mr. Hunt has been very valuable in this program.

Would you like to say anything?

Mr. **HUNT.** Yes.

Senator WARNER. But Mr. Harris, before that, would you also introduce your other associates that have traveled down from Washington, Melissa Neilson, who especially is working with the Congress of the United States, coordination with your plans to effect these regulations. Would you care to introduce her?

Mr. HARRIS. I certainly would, Senator. I count it a privilege. Melissa Neilson.

Senator WARNER. Would you stand, please.

Mr. HARRIS. Is my congressional liaison person. I think that one of the problems that probably came up in the previous administration was that this office did not work closely enough with the Congress. I feel that two of my major duties are, first, to work with the Congress and keep them informed as to what we are doing, and then to go out and sell a workable program to the industry, the States, and the environmental community. Melissa Neilson is a very important link in this whole operation. She came to us with sound background, having worked on committee staff on the Hill, had 6 years of congressional liaison work, I believe it was with one of the major copper companies in the country. And she brings a wealth of experience and knowledge of the Hill, and I think she is going to help our program a great deal.

Senator WARNER. Ms. Neilson and Mr. Hunt are prime examples of the new type of bureaucrat that we brought in under this administration who come from a background of having worked with mining and are prepared to help resolve the problems, am I correct in that?

Mr. HARRIS. That is correct. Everybody we have brought in has had experience on the other side of the fence, either with the States, with the mining industry, or somebody outside the Federal Government. And they know the problems that 9587 and the regulations written pursuant to it have caused to the industry. I think this was a sound approach. Now we are represented by career bureaucrats, plus people brought from the outside who have lived out there in the real world of mining with the States or with the industry. This takes us a long way down the road in understanding the problems we are trying to overcome.

Senator WARNER. I understand that a number of the career bureaucrats that you have retained have adopted a new attitude toward the enforcement of the old act and the adoption of new regulations, am I correct?

Mr. HARRIS. Yes, sir.

Senator WARNER. One of the things that I had always heard was that the Presidency was too big a job for one man. I think we have a man in there who is doing very adequate at this point.

Another thing I always heard was that the bureaucracy was sort of like a speeding train, and regardless of how much you tried, you couldn't change it.

Well, we didn't want to go in and have a political blood bath in this Agency, and we wanted to keep those qualified career people. So, thus far, we have changed our management positions, and I think that the industry and the States in their relationship with us at this time can or should be aware of the fact that with minimal leadership changes the direction of an agency can be changed.

One of those management positions is occupied by a gentleman that Congressman Wampler and I recommended to you, Mr. Griles.

Mr. **Harris**. Yes.

Senator **Warner**. Who comes from this part of Virginia.

Mr. **Harris**. Yes. Steve Griles is my personal deputy and a person in whom I am well pleased. I did not have background in steep slope and mountaintop removal type mining, having come from the Midwest. I didn't know but what everybody mined coal in flat ground, see. I recognized that was one of the weaknesses in my experience. As soon as I talked to Steve Griles, and I interviewed several other people, I knew that he came highly recommended from you, and after I talked to him at some length and found the depth of knowledge that he had in steep slope mining and mountaintop removal, I felt this was a man that should make a tremendous difference, in the Agency, bring an experience that I didn't have, and I don't think that I could have made a better choice.

Senator **Warner**. I think he is back home taking care of the store now.

Mr. **Harris**. That is right. We don't leave at the same time.

Senator **Warner**. He will be working on these new regulations and putting into those regulations the thought processes and experience he has gained from this part of Appalachia.

Mr. **Harris**. That is correct.

Senator **Warner**. Mr. Hunt, you were about to make some observations.

Mr. **Hunt**. Thank you, Senator.

I think you are confident to the point that I was going to make, I think Dick Harris adequately expressed the general direction of the Agency. One thing we do have now is a staff that is very cognizant of the problems we have in southwest Virginia and throughout Appalachia.

We want to get the mining back, back in the right track in this area, and I think we are going to do that. One thing that I think we have seen there is that in the past 4 months we have completely rewritten all the regulations.

Last Friday we sent out the last drafts, the last two sets of regulations that had yet to go out. We have accomplished in 4 months a task that proved to be a very difficult one for the previous administration.

Obviously Dick nor Steve Griles, nor myself, could do this ourselves. We have found that the technical staff in the Office of Surface Mining was literally tromping at the bit to have a chance to rewrite these regulations and make them reasonable.

I think we have found that to a great extent we do have a good staff there and they have eagerly endorsed our approach in this regulatory reform effort.

One of the things I have noticed in the last few months, we have been meeting with the various State representatives on these draft regulations, and one of the observations that came out of one of those meetings was the question of wheer we found all the competent technical staff to address all these difficult regulatory issues. The answer is that they were with the Agency the whole time. It is just that they didn't feel comfortable with presenting their views adequately prior to our coming on board.

So I think we are seeing an opportunity now and a direction in terms of the staff under Dick's guidance. It is very positive for the protection of the environment for coal mining and also our ability to improve coal production in the United States.

I want to say that one of the most difficult things—I sympathize with our protestors, our marchers out in front, because one of the most difficult things I found when I first came to the Agency was to tell people that I was from the OSM, because every time I tried to get it out, it seemed to catch in my throat. I think now we are seeing a new direction. We are seeing a new attitude in the staff, and I think we are moving in a very positive direction, and I think between now and the end of the spring of next year we are going to have a regulatory program that we all can live with.

Senator **Warner**. Let's just pause on this very important point. You have 33 to 35 draft regulations out for review now and you will put the other 2 regulations out for comment.

Mr. **Harris**. That shows the boss is a little behind. I told you yesterday two weren't out.

Senator **Warner**. That is what we brought him along for. [Laughter.]

What would be your expectation, gentlemen, as to when these regulations would become effective for the industry? They are in the comment stage now. What is your hope for the effective date for these new regulations?

Mr. **Hunt**. We have right now, we have the regulations, we are trying to bring them on as quickly as possible. Once we complete our regulatory—once we complete our regultory revisions—we then have to amend the State programs. Amendment of the State programs we can do very quickly. Rather than wait on all the regulations until we have some—some of the more difficult ones are going to take us a little bit more time. Rather than wait on the more difficult issues, those, once we can finalize, we are moving forward as expeditiously as possible.

One of the ones that Dick mentioned already is our State window regulation, which will allow us to adopt State regulations that are as effective as Federal regulations. Under that as effective language will be, will have a lot more flexibility in terms of looking at the State programs, a flexibility that I might add we felt existed prior to our administration within the act, but had never been fully implemented by the previous administration.

Under that particular regulation we are going to go forward as quickly as possible. Then the States can bring theirs, amend their regulations along with ours, and depending upon the length of time period in each particular State, in most States we expect to be able to see regulatory revisions, if appropriate, within 60 days after we get done revising ours.

The entire process will go into approximately the summer of next year, I think, July on the latest one. Overall, we are looking at a program that is going to be faster than that, and certainly by next year we will be seeing real reform in terms of the regulatory process. I might want to——

Senator **Warner**. Let's summarize this. By next summer the majority of these new regulations, both Federal and State, should be in operation, is that correct?

Mr. **Hunt**. Right.

Senator **Warner**. Is that what these folks have come here to hear?

Mr. **Hunt**. That is.

Senator **Warner**. That single sentence, I think, gets everybody's attention.

Mr. **Hunt**. We are moving forward as expeditiously as possible. Of course, we do have the administrative rules of procedure that we need to follow.

Senator **Warner**. I understand we are complying very carefully.

Mr. **Hunt**. Yes.

Senator **Warner**. All right.

Mr. **Hunt**. We do want public input. In fact, we have made special efforts to get inputs from all the State representatives who will be responsible for the program, but I might add one additional thing is we are utilizing, not just the regulations in this regulatory reform effort, we are also developing handbooks and technical memorandums that will provide flexibility and direction to the industry, and we are pursuing where the rules don't fit, we are pursuing the avenue of considering experimental practice and Dick mentioned that already, that we have been looking at a couple of experimental practices right now. So we can—where the existing rules absolutely don't fit, then we feel we have some flexibility to provide immediate relief, but in general we are looking at an overall regulatory program that the industry can live with my next summer.

Senator **Warner**. Mr. Harris, as you and I discussed yesterday there is the possibility of some emergency AML funds for the States of Virginia, Tennessee, and Kentucky being available. What time frame would you hope some of these funds could be received by the States?

Mr. **Harris**. According to the act, the AML, State AML grants are not available to the States until their permanent program has been approved. I would hazard a guess that in the case of Virginia, you have submitted a permanent program, it probably will receive conditional approval within the next couple of months, at which time then a request for AML funds can be forwarded to the office, and we can take action on it at that time.

Senator **Warner**. Within the next 90 or 120 days we should see money flowing to help correct some of these environment abuses?

Mr. **Harris**. Yes.

Senator **Warner**. Any comments on the blasting regulations, gentlemen?

Mr. **Harris**. Blasting regulations are a very difficult thing to address. The courts have found, first off, that the peak particle velocity of 1 inch per second as has been used in previous regulations was arbitrary and capricious and that standard was tossed out, and we are now working or have been working on the blasting regulations that I think makes a great deal more technical sense than a one-standard type. This is a step-by-step type of regulation.

Mr. Hunt could give you a little bit more insight into exactly what is written into it. I have not seen it. The technicians and Mr. Hunt worked on the original draft. They go after public comment, and they come back for me to take a look at them, and I don't know exactly what they have written into it. They know my philosophy and go on from there.

Would you like to comment?

Mr. **Hunt**. One of the things we do recognize is that the 1 inch per second peak particle velocity has not been an accepted standard and also in divergence with the available technical literature.

I have directed my staff to completely review all the latest studies that have been done by the Bureau of Mines and others, in terms of establishing a reasonable limitation of blasting. I think we recognize that some standard is necessary to protect the public from the effects of blasting.

We have recently developed a draft of the blasting regulation, which basically tracks the latest state of the art, of the knowledge at this point in blasting, and sets the range of available or acceptable standard for the peak particle velocity from blasting.

I think we have just completed a review of that regulation with the State regulatory authorities, and with the exception of the fact that the formula that we have set out is a little bit more complicated, it is not a simple 1-inch-per-second or simple 2-inch-per-second, but it does vary, depending upon a variety of factors, including the distance that you are away from various structures.

We feel confident that the new draft regulation is one that the industry can live with. It does provide flexibility for the State regulatory authority where necessary, and in our reviews with the various States, occurred about 2 weeks ago, we received very favorable reviews of this particular draft, and we have also had some limited review by some of the major industry groups involved with blasting. We found their general support of this particular regulation, so I think, although I don't have it with me so I can't quote the formula that we have proposed in the regulation, I think you will see that the formula that we are proposing is a workable resolution of this very difficult problem.

Senator **Warner**. I am going to ask Congressman Wampler if he has any questions at this point?

Mr. **Wampler**. Senator Warner, I don't know that I have any questions. I simply want to compliment Mr. Harris. This is one of the most refreshing statements that I have heard in a long time, either in Washington or out. I want to compliment you for it. There are some people in the Congress who felt, and I suppose I found myself in this category many times, that those who previously were administering the 1977 statute affecting surface mining perceived their mission either to abolish or seriously restrict surface mining. I think the regulations that were promulgated reflected that bias as I perceived it to be.

I hope as you continue with the regulatory reform, that you will keep uppermost in your mind any need for the statutory law and basic law.

I compliment you for proceeding. I think that is the first need, is to try to bring some semblance of reasonableness and commonsense into the regulatory process. But second, administrations change from time to time, it has been my observation. I hope this one doesn't for some time to come, and that is part of the observation.

The point is if there is need for a statutory change, I am sure that the Congress would welcome any suggestions or recommendations that you have to make in that regard. I am sorry that I was unable to be with you yesterday. I want to compliment you for spending that time touring southwest Virginia. I think surely now you have a better insight into some of the unique and peculiar problems of the terrain in southwest Virginia.

I was in my district office in Big Stone Gap conducting an open door session, and I talked to a large number of my constituents yesterday on a variety of problems, and surface mining being one of them.

I would like to point out, I don't know whether you had an opportunity yesterday to visit a rather unique experiment at southwest Virginia. We have a large demonstration farm in Wise County near Dixianna. This work is being carried on by a rather generous grant from the Penn-Virginia Corp., which is a large landholding corporation, in cooperation with our land-grant university at Virginia Tech at Blacksburg. I am scheduled to spend all day tomorrow at that farm observing some of the work that they are doing. This farm, I am told, is in excess of 1,000 acres. Most of it has been surface mined. Virginia Tech is trying to develop an approach, protocol, if you please, as to how we can reclaim the land in a responsible way, carry out agricultural and silvacultural practices on that land.

As I mentioned in my opening remarks, I think this is something we are going to have to give a lot of thought to, look quite a bit down the road as to how we are going to use our land. I am concerned about the preservation of prime agricultural land, because we all know that economic development is taking our prime agricultural land at a rather alarming rate. So it seems to me that we can use some commonsense and not only extract the coal which we badly need, but also using the latest technology, and certainly all the resources at our command, we can find ways to have real effective postmining use of this land. This is something I hope you will bear in mind as you indicated that you would. You did comment on the higher and better land use and I want to commend you for that.

One portion of the 1977 act that I strongly favor, and unfortunately we are not permitted to vote on a portion, you either have to vote yes or no—I have found certain provisions of the law so objectionable in the bill that I had to vote against it. This is the concept of assessing the industry on a per tonnage fee to go into a revolving fund to be used to reclaim the orphan or abandoned land. I think it would be fair to say in Virginia, I suppose this is true in other States, that most of that irresponsible type of mining occurred during the decade of the 1950's, partially the 1960's. And at that time coal was bringing, as I remember in some cases, $2 and $3, $4 a ton, and the operator simply was not making enough profit to put it back into the land. The public perhaps benefited from low energy costs.

I know of no consumer issue that is more sensitive than the ever increasing cost of electricity and other forms of energy. So as the price of coal goes up as it has, then energy rates are going to rise correspondingly. But the public did benefit in the sense that they had low utility rates compared to the level we are paying today.

I don't believe that we can permit that type of irresponsible mining. I think there is a way that we can do it that will protect the environment as reasonably as we can. Unfortunately, there are those who are among us who say that we ought to live in a risk free society. That is a rather utopian notion, but I would like to see those risks and inconveniences reduced to the lowest possible denominator.

Again, I just want to commend you and your associates, particularly pleased that Steve Griles is part of your management team. We regard him very highly here in Virginia. And I know of no man who has a better grasp of the peculiar problem of steep slope mining as he does. I want to thank you for coming and sharing your time, and wish you well as you continue this very important work.

Mr. HARRIS. Thank you, Congressman.

Senator WARNER. Thank you, Congressman.

Mr. HARRIS. Yesterday we did not see the agriculture demonstration that you are talking about. The Senator and I did fly to an area where they are putting in a very large housing development over in Buchanan County.

Senator WARNER. I might mention for the record among the stops that we had yesterday in between claps of thunder, clouds and rain, was at Paramount Coal Co. where Mike Quillen pointed out the problems of the high wall and how with revised regulation we can go back into those high wall areas and reclaim much of that land, and also extract a lot of valuable coal and leave it in a condition better than it is today. We were informed that there is practically, what was it, 4,000 or 14,000 miles of high wall?

Mr. HARRIS. I believe they said there was 4,000 miles of high wall.

Senator WARNER. Just in this area that could possibly be subject to rework.

We went to Clinchfield Coal Co. to look at the processing plant; the Blevins Coal Co. where we saw an example of one of the finest reclamation projects anywhere in the United States of America; and then we went to the Buchanchar Village of the Island Creek Coal Co., which you mentioned just a few minutes ago.

Mr. HARRIS. If I could have a minute, Senator.

Senator WARNER. Yes.

Mr. HARRIS. Under the previous administration, it was required that before you could leave a mountaintop removal tip mining site plat, you had to demonstrate that you had available to you the financial resources to carry out whatever development you were going to carry out. When you have a 10-year mining process or something of that sort, it is difficult to have a financial commitment on postmining land use more than 10 years ahead. It was almost an impossibility for people to do this.

I think that we can work in such a manner as to allow mountaintop removal projects, as long as the person has a good land use plan for that property, to actually create some flat lands as the result of mining, which will be a better, higher and better use than being the side of a mountain or something of that sort.

I think that we will be much more lenient, certainly know that we will be in allowing some of the operators to leave what will be usable flat lands and wotherwise mountain areas.

In West Virginia here awhile back I saw a fine high school on top of a mountain. There was no place else in that whole part of the county that you would have found that much flat land to put a nice school plant on. So these are real pluses as a result, I think, of giving you some flat land that you haven't had before.

Additionally, with the housing developments that can be located on some of these mountaintop removal sites, it gives the people for the first time a chance to build in an area where they are not subject to flash flooding and other hazards such as that. I think these can be positive forces in this mountainous area.

Mr. Wampler. We have in southwest Virginia been subjected to periodic flooding. As you saw the steep terrain, narrow valleys, usually there is a creek or river and a road and sometimes a railroad and people have been building there; as was the practice many years ago, they built their homes by open creeks as a method of carrying away waste and sewage. Obviously, as you point out the most desirable places to build on top of the mountain and hopefully get the level land and get the utilities and the roads that will service those areas. I am particularly delighted to hear your comment on the requirement of one who is going to develop that postmining use land to do it in a way that would not be so burdensome that he couldn't comply with any reasonable plan. I think experience as an operator should be brought into that. I think you are quite right in your operation.

Senator Warner. Our copilot was Danny Brown. Danny, where are you? Have you recovered from yesterday?

Mr. Brown. Just about.

Senator Warner. I am going to depart from the usual procedure of congressional hearings and try an experiment. I am down among friends and constituents. Since we have gotten the best experts in America here right in the heartland of southwest Virginia, if there are questions from the audience and they are directed to me, I will redirect the question to the witness. That is the way we do it occasionally. We will take a few minutes.

Anyone from the audience wish to direct a question through me to either of these gentlemen?

All right.

Would you identify yourself.

Mr. Baker. I am James Baker with the Harlan Kentucky Coal Operators Association. I ask will the industry have an opportunity and through what mechanics for continuous input into the review and to legislation and development?

Senator Warner. Mr. Harris.

Mr. Harris. Yes, we are meeting with industry people, with people from the States, environmental groups, and any group that wishes to have input into the regulations. We are having very regular meetings with the States in the East through the Interstate Mining Compact Commission. In the West, through the Western Energy Resources group. And we are working with various operators who have made comments on proposed regulations, and we will take your comments into consideration before making the final draft.

Senator Warner. Any other questions?

Identify yourself.

Mr. Mallamas. I am James Mallamas with the Cardinal Mining Co. One of the biggest problems in the mining areas when we have a high wall, we have to fill it back up again, and go on to another area, and then come back later on and tear this high wall out and mine out another block of coal. We have got to do something about that. This is double expense. It is diesel fuel being used, being wasted pushing the dirt back in there. Something has got to be done about this. That is our biggest problem.

Mr. **Harris**. I would ask Mr. Hunt to speak to your questions. He has been working on a regulation in that area?

Mr. **Hunt**. One of the problems that we acknowledge is what to do with the problem of the high wall. We have a law that we are about to follow which requires us to require you, the mine operators to completely eliminate the high wall after mining operations. However, we are currently looking at that particular portion of the law, and considering the impact of that portion of the law, and we have also carefully read the legislative history, and we have carefully read the administrative law cases that have been interpreting that particular aspect of law, and we feel that there is some flexibility available to us that was never completely utilized or acknowledged previously. This flexibility comes in in those areas where we are remaining abandoned mined lands. We are now developing a rule which will be coming out which would not require the mine operator to completely eliminate the high wall in those situations where he is remining previously mined lands, and there is existing high wall.

We feel that there is a situation that exists in southwestern Virginia and other areas of Appalachia where our existing regulations actually, as you know, impose greater environmental damage than if we allow some flexibility. One of the things we know through our past studies in southwest Virginia is that as much as 80 percent or more of our new strip mining operation in southwest Virginia will be on previously mined lands. When we, within the next, well, I think the schedule for that particular rule, I have it here, give me 1 second and I will try to find it. I am sorry, I can't find it quickly.

Senator **Warner**. That is all right. I am going to suggest that you and I, Mr. Harris, come up here to the blackboard just like we were in the field yesterday at the high wall and draw a picture up here and see if we can't demonstrate some of the ideas that we have in mind.

These are my examples of trees growing up here [making sketch]. Here is what we saw yesterday. This is the high wall and this is the land [indicating].

Now because of the advancement of new equipment, cost of coal and otherwise, it is possible now to go in and hit these seams with another lick and go back in here. Now explain to them what you are talking about.

Mr. **Hunt**. Our existing regulations would say if you came in and took a second cut on this high wall and remined this, that you would have to find enough spoil to completely return this entire area to the approximate original contour. Now our proposed rule would only require you to eliminate the high wall to the amount practical, using the available spoil. So that where you have this—where you take out this particular spoil [indicating], we are still requiring you to put it back into the mining pit. Under this type situation, you might only have to do something like this, and we will allow you to leave a portion of the high wall, and we think we can do that.

Senator **Warner**. There is now, the operator has gone back in—these are trees up in here—show us what you think it would be.

Mr. **Hunt**. The final contour?

Senator **Warner**. The final contour of this high wall.

Mr. **Hunt**. You would take all this spoil that he is taking out of here and backfill this pit in here so that the final land surface would consist of this [indicating].

We also have another rule that we are developing which would allow the operator to put all roads and drainage ditches on this backfill area, so that we can get better postmining land use. With this configuration, we can also end up with a configuration that came down with the high wall consisting of a road level in here and then back like this [indicating]. That would allow access into this area for alternate land uses, so if you had enough spoil in here, that you could leave a wide enough bench for a housing development or some other use; you might be able to come in and actually put a road in here and actually have some use out of this previously mined area.

Senator **Warner**. We were discussing yesterday of possibly requiring a little bit of this be graded up there, is that under consideration? [Indicating.]

Mr. **Hunt**. This is another rule that we have now. That is tied in with this road rule, whereas—this rule is for previously mined areas. We have another rule that we are working on. We are really approaching this from a variety of different fronts. It is a different issue.

We have your contour cut and one of the things that we have said we would like to permit is permit the drainage ditch or a road on this cut, and under those circumstances we are developing a policy interpretation of what it means to completely eliminate the high wall. In other words, if this is a virgin area originally you could come in and on this, when you backfill this approximately original contour, you could include a road on this backfill or a drainage ditch or whatever, and you would have to though shave back the existing high wall to a stable configuration, but you could allow discontinuance segments of exposed rock, and from a technical standpoint, type of mining that you do in southwest Virginia, this particular variance that we would allow can solve a lot of the problems that the operator, as he gets up with the upper part of this high wall and very steep varies because, as you know, one of the problems we have is when you get up into 35- or 40-degree slopes, a lot of circumstances, it is unsafe for the operator to try to work up in this very high segment in terms of the last 10 feet of the high wall. It becomes a situation where you are not putting the mine operator or you are putting the mine operator in a position——

Senator **Warner**. Do you have in mind the safety of these men operating this heavy equipment when you are looking at these regulations?

Mr. **Hunt**. And the safety of the men operating it and, too, the availability of the alternate uses of that property in the future.

Senator **Warner**. This is the type of thinking that is going on presently in connection with the revisions of these regulations, and this is a golden opportunity for interested parties to speak up.

How about any of these gents that work night and day on these projects in this area? Any comments or questions from you?

Mr. **Hunt**. I might add one last thing. As Dick mentioned in his opening speech, we think utilizing these rules that we can provide real flexibility within your existing statutory framework that would alleviate a lot of the problems we have seen in these steep slope areas. Where we see, as was mentioned, areas that these rules do not accomplish those problems, but we will be continuing to cause more environmental damage by trying to follow the rules exactly and an alternate approach, the director, Dick Harris, can use through his authority to permit an experimental practice, to evaluate an alternate technology. And we recently received the first experimental practice to allow an alternate land use, which would incorporate a high wall in Kentucky.

We are also utilizing all of our statutory authority to try to protect the environment, but also to make the rules and regulations reasonable.

Mr. **Harris**. One other thing I would like to comment on, Senator. As the rules are now, when somebody goes in for another cut on that high wall, in effect he buys the reclamation of this entire high wall, which is economically and physically impossible in this sort of country, because he can't go out and find enough excess spoil somewhere else to bring that back to approximately the original contour.

Our feeling is that you can take another cut here, you can utilize that resource, and end up with something that takes care of this much [indicating] of the high wall, which you would not have been able to do before, and do it with the spoil that you have available.

I think this makes it economically feasible and allowable so far as the proposed regs are concerned to come back in and take that next cut that is so vital to the coal industry in this area.

Senator **Warner**. All right. There being no more questions from anybody, we will now proceed to the next witness. We thank you, Mr. Harris.

Mr. Harris will remain with us throughout the hearing today. There will be a press conference at 12 noon, at which time Mr. Harris will join with Congressman Wampler and myself and Mr. Brown to field questions from the press.

Mr. **Harris**. Thank you very much.

Senator **Warner**. First, I want to insert in the record, Mr. Harris, before you depart, counsel, will you put in the record the following documents that were provided earlier to me.

Mr. **Sindelar**. On August 5, the General Accounting Office published a report entitled "Comments on Interior Surface Mining Regulations," which addresses regulatory reform needed in the areas of blasting, drainage control, bonding, and spoil disposal. We would like to insert this into the record.

We would also like to insert in the record a copy of the regulatory reform schedule showing the regulatory reforms that are out and the dates that they will be publicized and finalized.

[The material referred to follows:]

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

COMMUNITY AND ECONOMIC
DEVELOPMENT DIVISION

B-203769

AUGUST 5, 1981

The Honorable James G. Watt
The Secretary of the Interior

Dear Mr. Secretary:

Subject: Comments on Interior's Surface Mining Regulations
(CED-81-145)

The General Accounting Office has been reviewing the Office of Surface Mining Reclamation and Enforcement (OSM), Department of the Interior, regulations implementing the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). We initiated this review to follow-up on our September 21, 1979, report entitled "Issues Surrounding the Surface Mining Control and Reclamation Act" (CED-79-83) and because of congressional, State, industry, and public interest and controversy in controlling and reclaiming coal surface mined areas.

OSM is in the process of making major revisions to its regulations and we, therefore, do not plan further work at this time. However, during our regulatory analysis of seven regulations and discussions with various officials, we identified issues which we are suggesting OSM consider while revising its regulations.

--In 1978 OSM promulgated detailed design standards regulating the use of explosives to free the overburden from coal seams. According to many sources, studies on blasting's effects do not support OSM's proposed final regulations. In view of these studies OSM needs to review its support for its revised blasting regulations. Also, a legislative change may be needed to clarify the act's blast damage provision, which does not allow any building structure damage off the mine permit area. Some damage may be inevitable from blasting and overly stringent regulations could be excessively costly. (See pp. 6 and 7.)

--Before the act, some coal lands previously mined were degrading the environment because States did not require adequate financial protection when coal operators failed to complete reclamation work. The act and OSM's regulations changed this by requiring coal mine operators to

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obtain bonds guaranteeing that mined areas will be reclaimed. However, small operators are experiencing problems obtaining performance bonds from bonding companies because the companies object to certain provisions of the act, such as those relating to the bond's duration and amount. The act allows for alternatives to bonding such as a State reclamation fund. Based on our talks with West Virginia and Pennsylvania officials, alternatives appear attractive because they do not require bonding companies' participation and can provide for other short- and long-term environmental benefits addressed by the act. Overemphasizing bonding programs may create economic hardship for the small operator and inadequate funding for reclamation of coal mined lands. OSM needs to emphasize alternatives to bonding while revising its regulations. (See pp. 8 to 10.)

--The act provides an exemption (grandfather clause) for coal mine operators mining prime farmlands, provided they were mining them at the time the act became law. In May 1980, the U.S. Appeals Court for the District of Columbia issued a decision which might be viewed as allowing a coal operator with a preexisting permit to continue mining along a seam by buying or leasing coal rights without complying with the prime farmland provisions because of the exemption. In addition, our previous report showed that State and local land-use laws may reduce the possibility that prime farmland will be farmed following reclamation. Legislative changes may be needed to preserve prime farmlands by limiting the grandfather clause and land-use options. (See pp. 10 and 11.)

--Unchecked sediment (runoff) from coal mining operations can pollute and severely damage fish, water supplies, recreational areas and increase flood frequency. OSM developed design standards, including requiring coal operators to use sediment ponds to meet a uniform water quality performance standard. However, we believe these design standards do not adequately address the differing climatological, geological, and topographical conditions of each coal mining area and thereby limit State and coal mine operator flexibility in controlling sediment. Several Federal studies have raised questions about the need for and specific size of sediment ponds. Also, decreasing a stream's natural sediment level to meet a uniform water quality standard may adversely affect the stream by causing erosion damage. The State regulatory authority could be allowed to decide, on a site-by-site basis, the best method of controlling sediment without exceeding a stream's natural sediment level. (See pp. 12 and 13.)

--Coal mining generates acid water, which is extremely hazardous when discharged into waterways. Therefore, the act attempted to prevent such discharge by prohibiting entering a coal seam at a lower portion of the slope and mining in an upward direction. However, the prohibition may cause, rather than prevent, acid water drainage by increasing water pressure elsewhere in the mine causing acid water discharges. West Virginia and Pennsylvania officials told us that a site-by-site analysis appears needed to prevent acid water drainage regardless of mining method. A legislative change would be needed to eliminate the prohibition. (See pp. 13 and 14.)

--The overall thrust of the act's and OSM's excess spoil standards is to prevent haphazard dumping of spoil material, especially into valleys, which causes erosion, acid drainage, landslides, and water quality problems. However, the standards appear to unnecessarily limit the coal operators' flexibility while providing little additional environmental protection. According to a study done for the Bureau of Mines, operators could use other than OSM methods in providing environmentally safe valley fills. For instance, controlled dumping over a cliff could be as safe as truck hauling into valley fills at less cost, but is prohibited by OSM regulations.

When revising its regulations, OSM needs to consider allowing alternative methods, if environmentally sound, in disposing of excess spoil material. If not possible by regulation, then legislative changes would be needed. (See pp. 14 to 16.)

--Access roads to coal mines can cause severe environmental damage and need to be regulated. However, OSM attempted to do so by promulgating numerous design criteria for constructing, maintaining, and eliminating the roads. These regulations may not be needed because coal operators already have to comply with numerous other OSM regulations controlling the major environmental hazards of coal roads. When revising the road regulations, OSM needs to be cognizant of regulatory redundancy to prevent regulating mine operators unnecessarily. (See pp. 16 and 17.)

Another matter for your consideration is whether OSM and the States have the monitoring, inspection, and enforcement resources to ensure compliance with the act's and OSM's regulations. Once

OSM has approved their programs, the States will have primary responsibility for inspection and enforcement with OSM having oversight responsibility.

According to the Assistant Director, Technical Services and Research, OSM, the regulatory revisions will give the States and coal operators greater flexibility in meeting the act's environmental objectives. However, regulatory flexibility requires better trained inspectors and may involve a greater number of inspectors to ensure compliance. OSM is planning to reduce its number of inspections, and inspection and enforcement resources in several States may be inadequate. We believe a balance should be maintained between regulatory flexibility and effective monitoring, inspection, and enforcement. Without this balance, coal operators may be put out of business from excessive regulations, resulting in reduced coal production or, conversely, the environment could be severely damaged because of inadequate enforcement.

OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to determine if key regulations provided adequate environmental protection while allowing States and coal mine operators sufficient flexibility to choose the appropriate methods necessary to achieve the act's environmental goals at the least cost.

Our review consisted of interviewing officials of four State natural resource agencies (Colorado, Pennsylvania, West Virginia, and Wyoming), four coal associations, two coal companies, two environmental groups, one bonding association, the National Academy of Sciences, the Environmental Protection Agency, the Bureau of Mines, and OSM. During our review we also (1) analyzed technical data supporting surface mining regulations and responses to proposed regulations, (2) identified studies on cost/benefit analysis of environmental regulations and selected surface mining regulations, (3) reviewed the legislative history to determine the intent of the surface mining act, and (4) reviewed pertinent records, documents, and books at Federal agencies. (See p. 18.)

We appreciate the courtesy and cooperation extended to our staff during this review.

Sincerely yours,

Henry Eschwege

Henry Eschwege
Director

Enclosures - 2

SPECIFIC COMMENTS ON OSM SURFACE MINING REGULATIONS

BLASTING REGULATIONS

Blasting is necessary to free the overburden from the coal seam, but it can cause significant property damage. One study 1/ estimated that in 1975 improper blasting caused over $200 million in damage in the Midwest and Appalachia. In testimony before the Subcommittee on Energy and the Environment, House Committee on Interior and Insular Affairs, an official from the Center for Science in the Public Interest referred to another study which estimated property damage in Appalachia alone for 1965-75 at $1.5 billion.

To prevent blast damage, OSM promulgated in its regulations detailed design standards, including peak particle velocity 2/ and the distance to critical structures. Members of the industry, three States, and some environmental groups filed 22 complaints attacking the regulations in the United States District Court for the District of Columbia. The District Court rejected the attacks. Its decisions are reported as In re Surface Mining Regulation Litigation, 452 F. Supp. 327 (D.D.C. 1978) and 456 F. Supp. 1301 (D.D.C. 1978). The plaintiffs appealed. The Court of Appeals affirmed as to some of the regulations, reversed as to others, and remanded another issue for further proceedings in accordance with its opinion. (In re Surface Mining Regulation Litigation, 627 F.2d 1346 (D.C. Cir. 1980).) The peak particle velocity standard was found by the Court of Appeals to be unsupported by technical data and invalid because it was arbitrary and capricious. The distance regulations were found invalid because the act contains no provision authorizing the Secretary to prescribe distance limitations on blasting, but one section of the act does fix an explicit distance limitation.

OSM published revised blasting regulations for comment in the January 22, 1981, Federal Register. They included peak particle velocity standards partly based on a 1980 study done for the Bureau of Mines. The revised regulations recognize that some damage such as the loosening of old paint and lengthening of old cracks in buildings may occasionally occur.

1/Darcey, D., G. McMahon, E. Burns and B. Ulrickson "Strip Mine Blasting: A Study of Vibrational Pollution in the Eastern and Midwestern Coalfields" (1977).

2/Peak particle velocity is the speed at which geologic material is moved by the blast.

Industry, State, and environmental organizations criticized the revised regulations. Industry groups, including the Society of Explosives Engineers, the professional society of blasting experts, questioned the technical merits of the Bureau's report. Peabody Coal Company estimated the proposed regulations would increase its costs by $6.8 million without any significant environmental benefits. The Old Ben Coal Company said less than 10 firms nationwide had the expertise to comply with a portion of the regulations. An Illinois official said implementing the regulations would be so costly that it would be prohibitive.

The Illinois South Project, an environmental organization, contends OSM's blasting regulations are not consistent with the act's requirement that injury to persons and damage to property and water resources be prevented. According to the organization, OSM regulations cannot allow some threshold damage 1/ (cracks, loose paint, etc.) but must prevent it. Moreover, Illinois South discounts the usefulness of preblast surveys because, as OSM admits, they only document the buildings' structural condition visually apparent but do not analyze the structures' integrity to undergo stress and strain.

OSM is drafting revised blasting regulations to be completed by mid-July 1981. Final blasting regulations are to be published around January 1982. We suggest that OSM consider the following while developing new blasting regulations:

--Criticism of the studies supporting OSM regulations on technical grounds appears to indicate a need for more and better research. Additional research may be necessary on the effectiveness and cost of varying peak particle velocities and scaled distance factors. Research may also be needed on the impact of more powerful versus less powerful but more frequent blasts and the cumulative effects of continuous blasting over long periods of time.

--On the surface, OSM's proposed regulations published in the January 22, 1981, Federal Register, allowing some threshold blast damage, could reasonably be interpreted as conflicting with the act. Section 515(b)(15)(C) requires that injury to persons and damage to property be prevented. If some blast damage is inevitable or no blast damage is excessively costly to attain, OSM may want to ask the Congress to clarify the act's intent.

1/Threshold damage is the lowest level of blast damage; the others being minor and major blast damage.

BONDING REGULATIONS

While performance bonds have traditionally been required for mining operations, the bond amounts generally were not adequate to finish reclamation work abandoned by coal operators. Most States did not require sufficient bonding to complete the reclamation work. At least one State (Pennsylvania) did not even attempt to reclaim the land if the bond was inadequate. Also, unfinished reclamation work led to further environmental damage. To ensure the mined area will be reclaimed, the act requires bonds adequate for the State regulatory authority to complete the reclamation work.

With the more stringent requirements of the act and OSM regulations, bonding companies either stopped writing coal mining bonds altogether; limited their bonding to the larger coal operators; and/or required coal operators to pledge collateral, in some cases equal to the bond's face value, in addition to paying the bond premium. For over 2 years, OSM has been changing the bonding regulations to meet the bonding companies' objections. 1/ Yet as the Mining and Reclamation Council of America stated in a 1980 draft report, small- and medium-size operators are having an extremely difficult time obtaining bonds. In addition, a bond surety association official told us that no matter how the regulations are changed, small operators will continue to have problems obtaining bonds unless the act is changed.

The act does provide flexibility by allowing a State to implement an alternative system to bonding. The only alternative system we are aware of is a fund derived from a tax on coal production or permit application fees which may or may not be used with a bonding component. The fund is used by the State to complete unfinished reclamation work. To date, only West Virginia's program provides for an alternative system. West Virginia requires a $1,000 bond per acre and a reclamation fund derived from a 1-cent-per-ton tax on coal production.

In contrast, Pennsylvania requires a $4,000 per acre bond, and the bond amount will probably have to be doubled to comply with the act's bonding provisions. According to Pennsylvania's Department of Environmental Resources officials, requiring such a bond will put a number of small- and medium-size mine operators out of business.

1/Bonding companies dislike the act's sections concerning (1) the citizen's right to challenge bond release, (2) the State regulatory authority's right to increase the bond amount during the life of the bond, and (3) the bonding company's liability being extended to 5 to 10 years after mining operations cease.

The advantages of a separate fund with or without a bonding component are:

- --State regulatory authorities can begin reclamation work quicker since the State regulatory authority will not have to wait for completion of legal action requiring the bonding company to pay off the bond. Pennsylvania's Department of Environmental Resources officials told us that it takes about 6 months to a year to complete the legal process, during which time severe environmental damage may occur at the mine site.

- --Bonding companies might not be reluctant to participate in the program if it had a bonding component. Most, if not all, of the uncertainty associated with bonding under the act--bond duration, release, and amount--would be passed to the separate fund. West Virginia's Department of Natural Resources officials told us that bonding companies are willing to underwrite bonds in their State because of the State's fund.

- --State regulatory authorities will not have to rely on the financial solvency of bonding companies to complete reclamation work. According to Pennsylvania's Department of Environmental Resources officials, funds were not available to reclaim a number of properties because a bonding company failed.

After evaluating the regulatory history of OSM's bonding regulations, it is apparent that OSM provided States little encouragement or incentive to adopt alternatives to bonding. Unless OSM takes an active role in encouraging States to use alternatives, the following may result:

- --Small- and medium-size mining companies will be unable to operate without tying up significant financial resources.

- --Lands for which bonds are forfeited after the act's passage (Aug. 3, 1977) and before the States implement their bonding programs, 1/ will not be fully reclaimed. The act provides funds only to reclaim lands abandoned before its passage and most States awaiting program approval do not require operators to bond to the full reclamation cost. Pennsylvania officials believe this will be a significant problem in their State.

- --Mining's long-term effects will not be addressed. Once the bonding liability period runs out--5 to 10 years

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1/As of July 1981, the major coal-producing States have not implemented their bonding programs.

> after mining ceases, which the bonding industry already believes to be too long--any subsequent environmental damage will probably go uncorrected. For instance, subsidence (land settling) problems might not be noticed for years after mining ceases. Funds will not be available to take care of such problems unless a fund is available.

PRIME FARMLAND REGULATIONS

The act and OSM regulations provide for preserving prime farmland 1/ while allowing coal operations to continue. Overall, the impact of surface mining for coal on the Nation's agricultural production capacity is going to be relatively small. About 100,000 acres of land are surface mined each year, and most of this land is eventually returned to some level of crop production through reclamation. Conversely, about 1 million acres of prime farmland are permanently removed from production annually--about 80 percent through urbanization and about 20 percent through inundation by water projects.

While the disturbance of land for coal mining is not a major factor in withdrawing land from agricultural production at the national level, in some rural counties essentially the entire area is underlain with strippable coal. Obviously, surface mining for coal could have tremendous impacts, both physical and social, in such areas.

The act's provisions and OSM regulations set forth numerous design criteria which must be met by coal operators. We did not evaluate whether the design criteria were necessary to meet the act's objective of preserving prime farmland. However, we did focus on the following areas as they apply to preserving prime farmland:

> Coal operators exemption: Under the act, as interpreted by the U.S. Court of Appeals for the District of Columbia in May 1980, any mining operation with a permit approved before enactment of the act (grandfather clause) is excluded from the prime farmland provisions as long as the mining operation is the continued and contiguous operation of the same ongoing mine along its seam.

1/According to the U.S. Soil Conservation Service, prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops, and also is available for these uses. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed (including water management) according to acceptable farming methods.

(In re Surface Mining Regulation Litigation, 627 F.2nd 1346, 1362 (D.C. Cir. 1980).) Illinois, which has the most strippable coal reserves underlying prime farmland, has two heavily worked coal seams which are continuous. One seam has been mapped as being 42 or more inches thick throughout an area of 9,269 square miles underlying 55 counties. This decision might be viewed as allowing a coal operator with a preexisting permit to continue mining along the seam by buying or leasing coal rights without complying with the prime farmland provisions because of the exemption.

Our concern is that the prime farmland provisions may not be effective in preserving prime farmland and that the exemption provides a competitive advantage to a "grandfathered" coal operator who will not have to comply with the more costly regulations. A legislative change may be needed.

Preventing alternative land uses of prime farmland: The act requires that prime farmland be restored to 100 percent of its premined condition. This can be costly. AMAX Coal Company estimated that for four mines in Indiana they expended $27 million in 1978 and 1979 to purchase equipment and $8 million in additional annual operating costs to comply with the act's provisions. Further it is not certain that prime farmland can be returned to 100 percent of its premined condition. If it cannot, the act prohibits mining. In either case--restored or prohibited--the land can be used for purposes other than farming, thereby reducing the act's effectiveness.

Traditionally, governmental control of land use has centered at the State and local levels, and we are concerned with how the Federal Government can protect prime farmland from being lost to other land uses by requiring strict restoration or prohibiting mining entirely. In a previous report, "Preserving America's Farmland--A Goal The Federal Government Should Support" (CED-79-109, Sept. 20, 1979), we noted that State and local governments have had a limited impact in preventing farmland conversion to other uses.

Once lands have been returned to premined productivity or mining has been prohibited, the land can be used for any other purpose permitted by the State and local land-use laws. Without a comprehensive policy defining the national importance of retaining prime farmlands, the act's provisions can do little to prevent losing prime farmland. A legislative change may be needed.

SEDIMENT CONTROL REGULATIONS

Unchecked sediment from coal mining operations can severely damage fishlife, water supplies and recreational areas and increase flood frequencies. Therefore, the act requires mine operators to prevent--"to the extent possible using the best technology currently available"--adding sediment to streamflows. OSM regulations, however, went much further by requiring mine operators not only to build sediment ponds to control sediment but by telling operators how to build the ponds. Based on coal industry challenges and subsequent court rulings, some of these regulations were suspended.

Comments concerning the OSM regulations in the sediment control area question the applicability of a rigid set of national requirements to the climatological, geological, and topographical conditions existing in various mining areas. Those commenting recognize the importance of controlling sediment, but argue that design criteria do not adequately address the differing environment of each coal mining area. We suggest that OSM consider the following concerns in developing new sediment control regulations:

--The necessity for a sedimentation pond at all mines and, if necessary, what size the pond should be.

--The potentially adverse environmental effect of having sediment levels lower than those which occur naturally.

These concerns are discussed below and show the limiting effect of arbitrary criteria.

Pond necessity and size: OSM regulations requiring a sediment pond at all coal mines 1/ may be unnecessary and limit regulatory authority flexibility. According to OSM, requiring a sedimentation pond at all coal mines is necessary because the pond is part of the best technology currently available for controlling the effects of sediment on streamflow. However, in the environmental impact statement accompanying the regulations, OSM cited previous Department of the Interior studies which showed "excess sediment from mine activities was not found in small streams that were more than two miles from the mined area." If sediment does not reach a streamflow, why is a pond necessary? Nevertheless, OSM regulations would still require a sedimentation pond at a mine no matter the distance from a stream.

1/The regulations exempt mines with a small disturbed area.

We believe sediment ponds need to be considered as an option within a total sediment control system, with any pond needed being as small as possible to prevent the unnecessary disturbance of additional land. OSM sediment pond design criteria required the pond to be of sufficient size to detain the maximum amount of water expected from a 24-hour rainfall at any time during a 10-year period. However, the Environmental Protection Agency does not believe that information presently available allows tying sediment pond size criteria to a specific rainfall event. At this time, the Environmental Protection Agency is doing studies to help eliminate this information gap. In addition, there is the question of the rationale for using a 10-year/24-hour rainstorm requirement when the expected service life of the sediment pond may be less.

Potential adverse environmental consequences: Decreasing the natural sediment level entering a stream may cause downstream erosion. Therefore, by establishing uniform performance standards, OSM may be adversely affecting the environment. All streams have a level which keeps them in balance with the soil in the area. If the natural sediment level is reduced, the stream will compensate by eroding its banks and bottom until a sediment level is reached. In brief, the limits established by OSM regulations can cause erosion by decreasing the amount of sediment reaching a stream below that level which occurs naturally.

Even if stream erosion did not take place, we believe little is accomplished by changing a stream's sediment level during mining operations. At the conclusion of mining, the land is returned to approximately its premined state. The natural stream balance--since it is based on site-specific features such as geology, soils, and precipitation--will re-establish itself. In many areas of the country this natural sediment level will be in excess of the arbitrary limit imposed during mining. The regulatory authority should not have to enforce uniform criteria with the knowledge of potential degradation and the future return to higher sediment levels when mining ceases.

GRAVITY DISCHARGE OF ACID WATER

About 11,000 miles of streams in the United States have been contaminated by mine-generated acid water. To avoid such contamination, the act requires mine operators to locate mine openings in such a manner to prevent natural (gravity) drainage of acid water. According to OSM and industry officials, this means up-dip mining (entering a coal seam at a lower portion of the slope and mining in an upward direction) is prohibited.

Pennsylvania's Department of Environmental Resources officials disagreed, stating that the act only prohibited the gravity discharge of acid water. The officials believe that mine openings could be planned in an up-dip manner when mine sealings would prevent acid water discharge.

Based on OSM's response to West Virginia's regulatory plan, we do not believe OSM would agree with Pennsylvania's position. Under West Virginia's State law, the Director of the Department of Natural Resources is granted discretion to approve up-dip mining if necessary for safety and environmental reasons. Because OSM believes the act prohibits up-dip mining, it is requiring West Virginia to change its law before unconditionally approving its regulatory plan.

The OSM Region I Director and Pennsylvania and West Virginia officials we contacted all agree that a site-by-site analysis is the best way to prohibit discharge of acid water and the up-dip mining method may be needed in some cases to prevent acid water discharge. The key factor in the analysis is how to minimize pressure on mine seals and natural geological structures. Without such an analysis, acid water can break out from a mine anywhere, not just at the mine openings. According to West Virginia's Director, Natural Resources Department, several major breakouts of acid water have recently occurred even though down-dip mining was used. Several millions of dollars will be needed to prevent further acid damage.

It would seem that acid drainage from coal mines is a serious environmental problem which must be addressed before mining begins. Given the diversity in terrain, climate, and physical conditions, it would seem pertinent that a site-by-site evaluation be made of the best method to prevent acid drainage. In some cases up-dip mining may be a better method to control acid drainage. If OSM finds that up-dip mining may be appropriate but cannot approve this method because of the act, then OSM needs to seek a legislative change.

EXCESS SPOIL [1] VALLEY FILL REGULATIONS

Before the act, excess spoil was haphazardly dumped over mountain sides causing erosion, acid drainage, landslides, sedimentation, and water quality problems as well as the potential for loss of lives and property damage. The act and subsequent

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[1] Excess spoil is generated by expansion of overburden material beyond that needed to return the land to its approximate original contour and by mining, which removes mountain tops. Mountaintop spoil is usually placed in valleys or heads of hollows.

OSM regulations were designed to correct these problems and therefore called for specific standards concerning site selection, controlled placement, drainage, configuration, and design.

OSM promulgated design criteria regulations which limited the methods coal operators could use in disposing of excess spoil. Subsequently, OSM contracted with the National Research Council to evaluate alternative technologies and regulatory practices for the disposal of excess spoil from coal mines. The study is to be completed in late summer 1981.

Based on our regulatory analysis, we suggest that OSM consider the following concerns in revising excess spoil/valley fill regulations:

--Stability safety factor 1/ of valley fills should be based on a site-by-site evaluation rather than a 1.5 factor to prevent unnecessary design and construction costs as well as to provide better safety for the public.

In an October 1978 study done for the Bureau of Mines, engineers and consultants, Skelly and Loy, recommended a safety factor of 1.1 for fills in remote areas and a factor of 1.3 if failure of a fill could cause property damage. Others suggested safety factors of 1.7 or 1.8. OSM believes the added degree of protection by the 1.5 safety factor is warranted to protect the environment and offset the lack of long-term maintenance over the lifetime of the fill.

Better safety may be assured by leaving the appropriate safety factor up to the design engineer who would design on a site-specific basis. We believe in some cases this would result in cost savings and in other cases a higher degree of safety. However, provisions would have to be made to notify the public about valley fills, should land use be changed in the future.

--Transporting excess spoil from the mine pit to the dump site can be very expensive. Mine operators should be given sufficient flexibility to use controlled gravity dumping rather than truck hauling of excess spoil material when it is less expensive as long as it can be done in an environmentally sound way. According to Skelly

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1/According to the Chief, Bureau of Mines Reclamation and Process Waste Control, a stability safety factor of 1.0 means that all forces on the valley fill are in equilibrium and anything less is unstable.

and Loy and OSM's Region II Director, a site-by-site evaluation is necessary to do this.

--The act may be unnecessarily restricting appropriate structures (buttresses) to prevent landslides when the toe of the spoil area rests on a downslope. The act requires using only a rock toe buttress to stabilize valley fills. Skelly and Loy and OSM Region I officials disagreed with this restriction. Skelly and Loy stated such a blanket ruling could create rather than prevent stability problems, particularly in steep slope, thin, overburden conditions.

OSM's Region I Director stated that such a restriction is unnecessary and can result in additional costs to the mine operator. Both Skelly and Loy and the Region I Director recommend a site-by-site evaluation to determine the most effective way to stabilize fills, including using rock toe buttresses.

COAL ACCESS ROADS

Poorly constructed and maintained roads cause erosion, sediment, and dust from the disturbed areas. One study 1/ showed that about 10 percent of the total surface area disturbed by mining consists of roads. Recognizing the damage caused by roads, the act requires mine operators to control or prevent erosion and sediment; pollution of water; and damage to fish, wildlife, and public or private property. However, OSM regulations attempted to tell the mine operators how to meet these performance objectives by promulgating numerous design criteria for constructing and maintaining roads. In May 1980 the U.S. District Court for the District of Columbia ruled in a memorandum opinion that the road regulations were invalid based on a technicality--inadequate comment period. (In re Surface Mining Regulation Litigation, Civil Action 79-1144 (D.D.C. unreported opinion filed May 16, 1980).)

Our concern in this area is whether it is necessary to promulgate detailed design criteria to meet the act's performance objectives for roads. Other OSM regulations already address the problems associated with erosion, sediment, and water pollution. For instance, regulations already require coal operators to prevent to the extent possible adding sediment to streamflow thus requiring erosion, sediment, and water pollution controls to be in effect.

In revising the road regulations, OSM needs to be cognizant of regulations already promulgated to prevent unnecessarily regulating mine operators.

1/Grim, E.C. and Hill, R.D. "Environmental Protection in Surface Mining of Coal" (1974).

LIST OF ORGANIZATIONS CONTACTED DURING THE REVIEW OF SURFACE MINING REGULATIONS

Federal agencies

- Office of Surface Mining Reclamation and Enforcement - Headquarters; Region I, Charleston, West Virginia; and Region V, Denver, Colorado
- Environmental Protection Agency--Headquarters
- Bureau of Mines--Headquarters

State agencies

- Pennsylvania Department of Environmental Resources
- West Virginia Department of Natural Resources
- Wyoming Department of Environmental Quality
- Colorado Department of Natural Resources

Coal Associations/Coal Companies

- Mining and Reclamation Council of America--Washington, D.C.
- Pennsylvania Coal Mining Association--Harrisburg, Pennsylvania
- Western Pennsylvania Coal Operators Association--Pittsburgh, Pennsylvania
- West Virginia Surface Mining-Reclamation Association--Charleston, West Virginia
- Consolidation Coal Company--Pittsburgh, Pennsylvania
- Atlantic Richfield Company--Denver, Colorado

Citizen organizations

- Environmental Policy Institute--Washington, D.C.
- Public Lands Institute--Denver, Colorado

Other organizations

- The Surety Association of America--Iselin, New Jersey (telephone contact)
- National Research Council--Washington, D.C.

REGULATION REVISION SCHEDULE

	AIR QUALITY	ALLUVIAL VALLEYS	ANTHRA-CITE MINING	AUGER MINING	BACK-FILLING AND GRADING AOC	BONDING	COAL PROCESS-ING WASTE	CON-CURRENT SURFACE/ UNDER-GROUND	EXCESS SPOIL	EXPERI-MENTAL PRACTICE
DRAFT	06/30/81	08/06/81	07/07/81	07/17/81	07/14/81	N/A	07/03/81	07/07/81	07/14/81	08/06/81
TO STATES FOR REVIEW	07/02/81	08/17/81	07/09/81	07/20/81	07/16/81	03/26/81	07/07/81	07/09/81	07/16/81	08/17/81
STATE COMMENTS DUE	07/17/81	09/08/81	07/23/81	08/17/81	08/17/81	05/08/81	07/28/81	07/23/81	08/17/81	09/08/81
MEETING WITH STATES	07/17/81	09/09 - 09/11/81	07/24/81	08/18/81	08/17 - 08/21/81	N/A	07/29/81	07/24/81	08/17 - 08/21/81	09/09/81
DEVELOPMENT OF PROPOSED RULE	07/31/81	10/07/81	08/07/81	11/24/81	11/24/81	07/28/81	09/08/81	08/07/81	11/24/81	10/07/81
PUBLICATION OF PROPOSED RULE	08/27/81	10/30/81	09/01/81	12/29/81	12/28/81	08/20/81	10/02/81	09/01/81	12/28/81	10/30/81
PUBLIC COMMENT ENDS	09/28/81	12/18/81	10/01/81	02/26/82	02/26/82	09/21/81	11/02/81	10/01/81	02/26/82	12/18/81
DEVELOPMENT OF FINAL RULE AND ANALYSES	10/21/81	01/20/82	10/22/81	03/26/82	03/26/82	10/21/81	02/12/82	10/22/81	03/26/82	01/20/82
PUBLICATION OF FINAL RULE	11/16/81	02/18/82	11/17/81	05/10/82	05/10/82	11/13/81	03/09/82	11/17/81	05/10/82	02/18/82
EFFECTIVE DATE	12/16/81	03/22/82	12/17/81	06/10/82	06/10/82	12/14/81	04/09/82	12/17/81	06/10/82	03/22/82

	EXPLO-SIVES	FISH AND WILDLIFE	GEOLOGY	HYDRO-LOGY	IMPOUND-MENTS	IN SITU	LAND USE/ VARI-ANCES	PERMIT-ING	PRIME FARM-LAND	REMINING
DRAFT	07/14/81	06/25/81	07/17/81	07/17/81	07/08/81	06/30/81	06/25/81	08/06/81	06/29/81	07/17/81
TO STATES FOR REVIEW	07/14/81	06/26/81	08/17/81	07/20/81	07/20/81	07/02/81	06/26/81	08/17/81	07/01/81	07/20/81
STATE COMMENTS DUE	08/14/81	07/17/81	09/08/81	08/10/81	08/10/81	07/17/81	07/17/81	09/08/81	07/22/81	08/17/81
MEETING WITH STATES	08/18/81	07/17/81	09/09/81	08/11/81	08/10/81	07/17/81	07/17/81	09/09 - 09/11/81	07/23/81	08/18/81
DEVELOPMENT OF PROPOSED RULE	10/01/81	08/07/81	09/30/81	09/04/81	08/28/81	07/31/81	08/04/81	10/07/81	08/13/81	11/24/81
PUBLICATION OF PROPOSED RULE	10/23/81	09/03/81	10/30/81	10/02/81	10/02/81	08/27/81	08/28/81	10/30/81	09/09/81	12/28/81
PUBLIC COMMENT ENDS	11/23/81	10/05/81	12/18/81	11/30/81	12/02/81	09/28/81	09/28/81	12/18/81	10/09/81	02/26/82
DEVELOPMENT OF FINAL RULE AND ANALYSES	12/23/81	10/22/81	01/17/82	01/19/82	01/12/82	10/21/81	10/21/81	01/20/82	11/20/81	03/26/82
PUBLICATION OF FINAL RULE	01/15/82	11/17/81	02/18/82	02/12/82	02/12/82	11/16/81	11/16/81	02/18/82	12/16/81	05/10/82
EFFECTIVE DATE	02/15/82	12/17/81	03/22/82	03/15/82	03/15/82	12/16/81	12/16/81	03/22/82	12/18/81	06/10/82

	REVEGE-TATION	ROADS	SEDIMENT PONDS	SPECIAL BITUMINOUS COAL MINING IN WYOMING	SUBSI-DENCE	SUPPORT FACILITIES COAL PROCESSING WASTE	TOPSOIL		
DRAFT	06/25/81	07/07/81	N/A	07/10/81	07/07/81	06/25/81	06/25/81		
TO STATES FOR REVIEW	06/26/81	07/09/81	N/A	07/14/81	07/09/81	06/26/81	06/26/81		
STATE COMMENTS DUE	07/17/81	07/23/81	N/A	07/24/81	07/23/81	07/17/81	07/17/81		
MEETING WITH STATES	07/17/81	07/24/81	N/A	07/28/81*	07/24/81	07/17/81	07/17/81		
DEVELOPMENT OF PROPOSED RULE	08/07/81	08/07/81	05/18/81	08/07/81	08/07/81	08/04/81	08/07/81		
PUBLICATION OF PROPOSED RULE	09/03/81	09/01/81	06/12/81	09/03/81	09/01/81	08/28/81	09/03/81		
PUBLIC COMMENT ENDS	10/05/81	10/01/81	08/11/81	10/05/81	10/01/81	09/28/81	10/05/81		
DEVELOPMENT OF FINAL RULE AND ANALYSES	10/22/81	10/22/81	09/18/81	10/26/81	10/22/81	10/21/81	10/22/81		
PUBLICATION OF FINAL RULE	11/17/81	11/17/81	10/22/81	11/19/81	11/17/81	11/16/81	11/17/81		
EFFECTIVE DATE	12/17/81	12/17/81	11/23/81	12/21/81	12/17/81	12/16/81	12/17/81		

N/A - Not applicable.

* In Denver.

Office of Surface Mining Rulemaking Calendar

Regulation	Draft to States	Meeting With States	Proposed Rule Published	Final Rule Published	OSM Contact
Abandoned mine reclamation	complete	6/22/81	10/14/81	2/9/82	Chuck Beasley, 202/343-4012
90-day abatement extension	N/A	N/A	complete	8/31/81	Harriet Marple, 202/343-5884
Inspection & enforcement	complete	complete	8/14/81	11/2/81	Steve Griles, 202/343-5311
State window	complete	complete	6/16/81	8/30/81	Art Abbe, 202/343-53[illegible]1
Federal lands program	complete	6/29/81	9/16/81	1/7/82	Don Maurer, 202/343-4225
State programs	complete	6/22/81	9/16/81	1/7/82	Carl Close, 202/343-4225
Lands unsuitability	complete	6/22/81	9/16/81	1/7/82	Carl Close, 202/343-4225
Small operator assistance	complete	7/13/81	12/4/81	6/1/82	Carl Close, 202/343-4225
Sedimentation ponds	N/A	N/A	6/12/81	10/22/81	Jose del Rio, 202/343-4022
Prime farmlands (exemption)	N/A	N/A	complete	6/26/81	Arlo Dalrymple, 703/756-6964
AOC variances	N/A	N/A	6/22/81	9/4/81	Chuck Meyers, 202/343-5747
Two-acre exemption	N/A	N/A	complete	6/26/81	Stan Zeccolo, 202/343-4264
Bonding	complete	N/A	8/20/81	11/13/81	Ella Brown, 317/269-2659
Permitting	8/17/81	9/9/81	10/30/81	2/18/82	Willis Gainer, 615/637-8060
Subsidence	7/9/81	7/24/81	9/1/81	11/17/81	James Gilley, 304/342-8125
Roads	7/9/81	7/24/81	9/1/81	11/17/81	Glen Bonar, 615/637-8060
Blasting	7/14/81	8/18/81	10/23/81	1/15/82	Russ Price, 202/343-4022
Remining	7/20/81	8/18/81	12/28/81	5/10/82	Mikhael Robinson, 202/342-8125
Excess spoil	7/16/81	8/21/81	12/28/81	5/10/82	Cliff Vaughn, 615/637-8060
Alluvial valleys	8/10/81	9/4/81	10/30/81	2/18/82	Dan Kimball, 303/837-3773
Hydrology	7/20/81	8/11/81	10/2/81	2/12/82	Jim Chisholm, 615/637-8060
Impoundments	7/9/81	8/11/81	10/2/81	2/12/82	Robert Glazier, 317/269-2666
Prime farmlands (postmining)	7/1/81	7/23/81	9/9/81	12/16/81	Ralph Ewalt, 317/269-2666
Revegetation	6/26/81	7/17/81	9/3/81	11/17/81	Charles Wolf, 317/269-2676
Postmining land uses	6/26/81	7/17/81	8/28/81	11/16/81	Chuck Meyers, 202/343-5747
Backfilling & grading	7/16/81	8/21/81	12/28/81	5/10/82	Ray Aufmuth, 202/343-4022
Steep slope mining	7/16/81	8/17/81	12/28/81	5/10/82	Ray Aufmuth, 202/343-4022
Air quality	7/2/81	7/17/81	8/27/81	11/16/81	Robert Goldberg, 202/343-4022
Fish and wildlife	6/26/81	7/17/81	9/3/81	11/17/81	Ed Penetecost, 816/374-2690
Coal processing waste	7/7/81	7/29/81	10/2/81	3/9/82	Jerry Herndon, 304/343-8125
Geology	8/17/81	9/9/81	10/30/81	2/18/82	Robert Stansfield, 615/971-5100
Topsoil	6/26/81	7/17/81	9/3/81	11/17/81	George Chalfant, 304/345-3394
Experimental practices	8/17/81	9/9/81	10/30/81	2/18/82	Ralph Ewalt, 317/269-2666
Auger mining	7/20/81	8/18/81	12/28/81	5/10/82	John Ventura, 304/342-8125
Support facilities	6/26/81	7/17/81	8/29/81	11/16/81	Robert Campbell, 317/269-2624
In situ	7/2/81	7/17/81	8/27/81	11/16/81	Robert Goldberg, 202/343-4022
Concurrent surface/underground mining	7/9/81	7/24/81	9/1/81	12/17/81	Jim Gilley, 304/342-8125

Senator WARNER. Will you announce the next witness, please.

Mr. SINDELAR. We have the next witness, Mr. Ronnie N. Haynes, Environmental Specialist, with the U.S. Fish and Wildlife Service, from Atlanta.

Senator WARNER. We have missing Mr. Gillman, who was invited, the Deputy Chief for State and Local Operations, Soil Conservation Service, Department of Agriculture. He hopefully is still on his way.

Thank you Mr. Haynes, if you will proceed. Mr. Haynes, your statement in its entirety will be placed in the record. I would hope that you would not feel it necessary to read this statement, but that you could address the high points.

STATEMENT OF RONNIE HAYNES, ENVIRONMENTAL SPECIALIST, U.S. FISH AND WILDLIFE SERVICE

Mr. HAYNES. My name is Ronnie Haynes, and I am here today representing the U.S. Fish and Wildlife Service. My present duty station is region 4, Atlanta, Ga., where I serve as an environmental specialist (emphasis on terrestrial ecology and coal/mineral developments) in the Office of Environment.

I received my B.S. in biology from Arkansas State University, my M.S. in zoology from the University of Arkansas, and my Ph. D. in zoology, with emphasis in wildlife management and land use from SIU in 1976.

I have been asked to present the FWS viewpoint relative to the issue of return of mined lands to approximate original contour and considerations for fish and wildlife.

Past contour surface mining and other mining variations in Appalachia have left thousands of miles of high wall, benches, and outslopes that have significantly fish and wildlife habitat (Spaulding and Ogden 1968). Erosion and sedimentation and landslides from mined areas have resulted in clogged and filled streams, rivers, and reservoirs, with associated adverse impacts on fish and other aquatic organisms; with increased flooding; and damaged or destroyed croplands in some cases. Acid-mine drainage resulting from exposed toxic-forming materials in high walls and other surfaces has adversely affected thousands of miles of aquatic habitat and natural drainage systems (Doyle 1976, Spaulding and Ogden 1968). High walls have created isolated or restricted access by man and wildlife to the mountaintops above them, and can block or restrict travel across mined areas by many species of wildlife (Boccardy and Spaulding 1968, Dudderar 1973, Fowler and Perry 1973, Samuel and Knotts 1974).

In passing the Surface Mining Control and Reclamation Act of 1977 (SMCRA, Public Law 95-87), Congress recognized the numerous environmental and social impacts of surface mining; and, among other things enacted specific provisions that required mined land to be returned to its premining approximate original contour (section 515(b)(3) of the act). Recognizing that with proper planning and according to very specific criteria, variances from the approximate original contour requirement (including the creation of terraces and benches) could provide significant safety and environmental benefits (including the creation of desirable wildlife habitats), Congress provided for specific variances. While all high walls are required to be backfilled and eliminated (sections 515(b)(3), 515(d)(2), 515(e)(1)) of the act, backfilling operations to eliminate high walls do not preclude the possibility of creating terraces and benches or obtaining a variance from the approximate original contour requirement. Field studies have shown that, under certain conditions, terraces, benches, and high walls provide benefits for certain wildlife species.

TERRACES AND BENCHES

Terraces and benches can provide level surfaces and open sites in otherwise steep and forested areas. When properly designed to control erosion, sedimentation, acid-mine or alkaline drainage and other potential problems, vegetated (including wildlife plantings) terraces and benches can benefit wildlife by increasing habitat diversity and edge. Increased habitat diversity and edge may also provide food, cover, and movement corridors for a larger number of species than typically found in strictly forest cover (Michael Baker, Jr., Inc., 1981, Leopold 1933).

Field studies on both abandoned and reclaimed mine lands have shown the value of vegetated terraces and benches to a variety of wildlife species including the wild turkey (*Meleagris gallopavo*), ruffed grouse (*Bonasa umbellus*), mourning dove *Zenaida macroura*), white-tailed deer (*Odocoileus virginianus*), cottontail rabbit (*Sylvilagus floridans*), and a number of birds, mammals, reptiles, and amphibians. (*Allaire* 1979, Crawford et al. 1978, Curtis et al. 1978, Fowler and Perry 1973, Kimmel and Samuel 1978, Michael Baker, Jr., Inc. 1981, Tennessee Valley Authority 1981).

HIGHWALLS

Under certain conditions, such as when associated with water impoundments and adjacent vegetated areas, highwalls can provide useful habitat for particular species of wildlife (Leedy 1981, Leedy and Franklin 1981). Several field studies have documented the use of high walls as nesting and resting places for a variety of birds, including the eastern bluebird (Sialia sialis), eastern phoebe (Sayornis phoebe), rough-winged swallow (Stelgidopteryx ruficollis), red-winged blackbird (Aqelauis phoeneiceus), raven (Corvus corax), and certain raptors (Allaire 1979, 1978; Crawford et al. 1978; Curtis et al. 1976; personal communication: Letter and report of February 29, 1980, from Dr. Robert H. Giles, Jr., professor of wildlife management, Virginia Polytechnic Institute and State University, Blacksburg, Va., to Dr. Ronnie J. Haynes, U.S. Fish and Wildlife Service, Atlanta, Ga.). Highwalls associated with last-cut lakes, formed when final mine cuts are allowed to fill with water (pre-SMCRA), can provide limited benefits to some fish and other aquatic organisms; for example, hiding places between ledges and in crevices, although more sloping shorelines in the form of an increased littoral zone may be more beneficial (U.S. Office of Surface Mining 1981). Also, certain species of reptiles and amphibians have been shown to use slopes and ledges formed by the accumulation of debris from highwalls (Frischknecht 1978).

Several suggested management procedures that may enhance the use of highwalls by certain wildlife species are:

One, removal of loose rock and the creation of ledges for nesting and resting sites and to promote the establishment of mosses, ferns, and other plants.

Two, spraying the face of the highway with a mulch and fertilizer mixture to further assist the establishment of mosses, ferns, and other plants. The establishment of such vegetation should improve appearance and increase the stability of the otherwise exposed highwall.

Three, cover exposed coal seams or other acid-forming or toxic-producing layers in the face of the highwall.

Four, grade benches so that they slope toward the base of the highwall, thereby creating a water-retention basin, which would provide useful food and cover for some species (personal communication, letter and report of February 29, 1980, from Dr. Robert H. Giles, Jr., to Dr. Ronnie J. Haynes). However, this practice could also be detrimental in that it may cause a buildup of acid waters at the base of the highwall or undermine the highwall.

Five, for extensive highwall developments, travel lanes for natural movements should be provided at interspersed points to assure wildlife vertical access above and below highwalls.

CONCLUDING STATEMENT

The information above documents some beneficial and possibly enhancing uses of terraces, benches, and high walls by certain species of wildlife; but, also references some of the negative environmental impacts associated with past mining operations in Appalachia. This and any other appropriate information should be considered by reclamation planners and decisionmakers when developing or reviewing plans, especially plans for the reclamation of abandoned mine lands, where the negative impact on wildlife use resulting from grading of well-vegetated benches and backfilling to eliminate highwalls may outweigh any positive benefits associated with these activities. Criteria for determining specific site conditions where highwalls, terraces, and benches could be beneficial need to be determined. Such criteria would need to be carefully developed considering any major differences in conditions in the Eastern and Western United States, for example, east or west of the 100th meridian). Thus environmental values and the value of high walls to certain species of wildlife, that is, raptors, in the Western United States may be significantly different from that found in the Eastern United States. Limited use of these features may be practical based on site-specific conditions, but unlimited approval to incorporate such features into reclamation plans is not desirable from the perspective of fish and wildlife habitat and related environmental values (Leedy 1981, Leedy and Franklin 1981).

As you know, the Department of the Interior is continuing to pursue enforcement of SMCRA. As I have noted, the leaving of highwalls can have adverse effects on the environment. Nevertheless, means for enhancement of wildlife habitat do exist in reclamation planning through variances under the act and regulations and we encourage those involved in such planning to remain alert for opportunities to implement them.

I would be pleased to answer any questions this committee might have.

Senator WARNER. Thank you.

Are there any questions in the audience. Please direct them to me and we will see if we can answer them. This is another expert from the Department of the Interior. He is your employee. He is here to serve you and respond to your inquiries.

Mr. WAMPLER. I certainly want to thank you for coming and for giving us this statement and presenting it to us. You indicated, and in your statement you say that past contour surface mining and other mining variations in Appalachia have left thousands of miles of high walls, benches, and outslopes that have significantly, I believe the word is omitted, damaged fish and wildlife habitat. I don't think anyone could dispute that. I think that is correct.

Let me ask you, in your professional judgment, how much damage does accepted practices and principles of agriculture and silvaculture affect the habitat of fish and wildlife? Would it be significant or insignificant?

Mr. HAYNES. I am not trained that well in agriculture and silvaculture, and I don't want to comment on that. I will issue a statement to the effect that there are some adverse impacts that I am aware of through reading of the literature concerned with agricultural operations, and erosion sedimentation. How they stack up against the mining impact, would need to be evaluated by a professional.

Mr. WAMPLER. In your judgment, if the Commonwealth of Virginia were to build a superhighway, as they have, build a new highway through the mountain areas of southwest Virginia and under accepted engineering practices, they leave extremely high walls. Would you say that would have adverse and significant effect on fish and wildlife?

Mr. HAYNES. Well, I would say personally that there is always potential where adverse effects, if the operation is not properly engineered, properly designed, considering the possibilities of such impacts—if those possibilities are considered and integrated into the design, you might be able to prevent some or eliminate most or all.

Again, I am not a highway engineer. There is always a potential for run-off of materials, toxics or otherwise, in aquatic systems or landslides. That potential always exists.

Mr. WAMPLER. I gather you envision your responsibilities to try to minimize these hazards, regardless of where they might occur, whether surface mining, agriculture, silvaculture, building highways, airports or whatever it might be.

Mr. HAYNES. Being trained in wildlife management, I would assess each particular situation from my knowledge of the particular species of wildlife or fish. I would try to see what proposed design criteria were and see how those affect that particular species or groups of species and they try to minimize, prevent, or enhance the situation the best that I could.

Mr. WAMPLER. I don't think I would have any quarrel with what you are attempting to do. I think what bothers me and many that I have talked to is the so-called snail darter syndrome that we saw evidenced in our country a few months ago. I think most southwest Virginians by nature are outdoorsmen. They are sportsmen, they are hunters, fishermen, and they have a high degree of sensitivity to this.

It is my belief and has been for some years with proper reclamation of our surface mining lands, we can have small impoundments of water that hopefully would be adaptable to support fish, cover for wildlife, and this was once a hunter's paradise, and we would like to see it return that way.

I think you make a very valid point that we must take into account reasonable provision to try to prevent adequate cover for fish, wildlife, water impoundments, and also the quality of it. I quite agree with you. The point is what is reasonable and what is unreasonable, I guess.

Mr. **Haynes.** If I could point out many of the things that I do are involved with trying to provide technical services relative to fish and wildlife. Mr. Harris pointed out some of the handbooks and the sourcebook-type documents that the Office of Surface Mining has been preparing to assist State regulatory authorities and coal operators. The Fish and Wildlife Service, as a technical service organization, has participated with OSM in a number of cases in trying to define what some reasonable systems might be to protect, reclaim fish and wildlife values and address those needs. We are trying to provide those services within our realm of expertise.

Senator **Warner.** Thank you.

You know one of the things I look forward to in coming to southwest Virginia is to go fishing. I went fishing late last night and didn't catch a single bass, and the fellows told me the muskies are eating up the bass. Is this your problem? [Laughter.]

Mr. **Haynes.** I don't know how to comment on that.

Senator **Warner.** I want a complete detailed explanation from you on that subject. [Laughter.]

If necessary, we will hold a congressional hearing down here on that subject.

Thank you very much.

Mr. **Haynes.** You are welcome.

Senator **Warner.** Our next witness will be Mr. Bowling, executive director of the Interstate Mining Compact Commission.

Thank you, Mr. Bowling, for joining us today.

Mr. **Bowling.** Thank you for asking me.

Senator **Warner.** I understand you can speak almost for 16 States.

Mr. **Bowling.** Yes.

Senator **Warner.** When you opened your arms, I didn't know whether you were going to be an evangelist or a spokesman on the coal industry.

Mr. **Bowling.** Both.

STATEMENT OF KENES C. BOWLING, EXECUTIVE DIRECTOR, INTERSTATE MINING COMPACT COMMISSION

Mr. **Bowling.** Mr. Chairman, members of the committee, my name is Kenes Bowling. I am the executive director of the Interstate Mining Compact Commission. I represent Governor James here today in his capacity as chairman of the Interstate Mining Compact. On behalf of the Interstate Mining Compact, we wish to express our appreciation to the chairman and members of this committee for the opportunity to come before you today and express our views on the subject of the Secretary's proposed reorganization of the Office of Surface Mining.

Our compact includes the member States of: Alabama, Arkansas, Illinois, Indiana, Kentucky, Louisiana, Maryland, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, and West Virginia. These 16 States represent approximately 85 percent of the coal mined in the United States each year. All of our coal-producing member States are working to gain an approved reclamation program in their respective States in accord with the Surface Mining Control and Reclamation Act of 1977, and all States expect to have approved programs by no later than early 1982.

Since the enactment of the 1977 Federal act, our States have operated under the interim Federal program with regulatory enforcement being shared between OSM and the States. This phase of the regulatory program anticipated by the Federal act is due to end soon, and the States will, in the near future, assume the primary role of regulatory responsibility with OSM's oversight. Because of this shift in responsibility anticipated by the Federal law placing much more of the regulatory obligation upon the States with a corresponding reduction in OSM's involvement, the Secreary has proposed replacing OSM's 5 regional offices with 14 State offices, supported by 6 field offices and 2 technical service centers.

The Interstate Mining Compact would like to voice its support for this reorganization plan put forth by the Secretary. We feel that the new State offices will allow OSM to maintain closer touch with the States and better enable it to carry out its changing mission of an agency lending support to the States rather than acting as the primary enforcer of the law.

By eliminating an intermediate bureaucracy on the Federal level, communication between the States and Washington will be enhanced. Redundancy of OSM functions should be diminished and Federal personnel and office costs reduced, resulting in less operational cost for OSM and the saving of tax dollars. In addition, the States will feel the benefits of this reduction in the need for bureaucratic response and thereby gain additional time and resources to devote to enforcement of the approved State programs. These reduced costs and increased efficiencies can be accomplished, however, without a weakening of the overall reclamation effort due to the increased role of the States as primary enforcers of the States' regulatory programs as approved by the Secretary. The members of the Interstate Mining Compact feel that OSM's new organization will facilitate congressional intent under the permanent regulatory program. This reorganization will allow OSM to be in a position to grant assistance to the States and to review the efforts of the States while allowing each individual State to maintain the primary obligation for enforcement of its own approved program.

The Interstate Mining Compact would also like to take this opportunity to commend the Secretary and the Office of Surface Mining for their willingness to reach out to the States and involve them in a truly meaningful way with the Secretary's regulatory reform efforts. We appreciate the opportunity to have input into the Secretary's current reassessment of the surface mining regulations administered by OSM and the States. Due to the geographical diversity of the affected States, it is especially important that the States have the opportuntiy to help shape the regulations that they will be enforcing. I speak for all of our member States when I say that we feel the firm beginning of a true partnership with the Office of Surface Mining under its current leadership, and we look forward to working with OSM in the future to insure an adequate reclamation effort in all of our member States where coal is mined.

Should Public 95-87 be changed? The Interstate Mining Compact at the present time has not, as a group, addressed this issue. We will, in all probability, respond to this after our annual meeting next April. However, several of our member States do feel some change will be necessary. For instance, one State has suggested the following change.

Since August 3, 1977, this State's coal industry has deposited approximately $40 million into the Abandoned Mine Reclamation Fund. Under the current language of section 404, this State cannot use any of the moneys for mined land abandoned after August 3, 1977, although mining may have commenced prior to August 1977.

Section 404 of title IV of the act provides that: Lands and waters eligible for reclamation or drainage abatement expenditures under this subchapter are those which were mined for coal or which were affected by such mining, waste, coal processing, or other coal mining processes, and abandoned or left in an inadequate reclamation status prior to August 3, 1977, and for which there is no continuing reclamation responsibility under State or other Federal laws.

Their suggested amendment is:

Delete: "prior to August 3, 1977, and for which there is no continuing reclamation responsibility under State or other Federal laws."

Substitute: "prior to the date a State program is approved by the Secretary pursuant to section 503 of subchapter V."

In closing, Mr. Chairman and members of the committee, let me again say thank you for the opportunity to come before you today and express the views of the 16 member States of the Interstate Mining Compact on this very important subject. I will be happy to respond to your questions during the remainder of our time.

Mr. Chairman, I have some additional testimony that Alabama asked me to read into the record.

Senator **Warner**. We will admit that.

Mr. **Bowling**. Since you are running out of time, and you will see that is entered in the record, I will forgo the reading.

Senator **Warner**. It is done, and I thank you on behalf of the interstate mining compact.

Mr. **Bowling**. Again, Senator Warner, let me thank you for the interest and being able to express the views of the 16-member States of the interstate mining compact. I will be happy now to respond to any questions, if there are any.

[The comments of the State of Alabama follows:]

ALABAMA COMMENTS

The Alabama Surface Mining Reclamation Commission as the Regulatory Authority of the State of Alabama believes it is particularly appropriate to note the new and highly desirable approach adopted by the Secretary of the Interior of meeting with representatives of the States at their request to discuss their ideas and to aid them in developing regulatory concepts. There is a commendable and responsive change in attitude of the Office of Surface Mining which can result in a true partnership in meeting the goals of the Act and the Nation's needs. Enduring and strengthened efforts are needed to eliminate those burdensome and fruitless regulations that serve to increase governmental drudgery, dissipate tax funds and further increase the consumer's energy costs. The Secretary can best execute his responsibility in this area by continued review and appropriate revision of the regulations to allow the states to utilize those methods most suited to their respective diversity. Efforts to meet the requirements of the Act will be enhanced by the Secretary's willingness to truly involve the states in the reassessment of the current regulations. Since many of the existing regulations are untested as is the full implementation of the Act, there is a remaining question of the practicality and cost-effectiveness of many requirements.

There are provisions of the Act which raise immediate concern and which the subcommittee should subject to further inquiry. The following is not intended to be a comprehensive listing, or even one of the significant items; it is intended to identify areas which will create difficulty or ambiguity in the implementation of this legislation as currently written.

Section 503(a)(7)

This Section would greatly aid implementation of programs to meet the particular physical conditions of each State if it were reworded to provide for rules and regulations consistent with and sufficient to implement the requirements of the Act.

Section 507(b)(14) (and other Sections)

The phrase "qualified registered professional engineer, or professional geologist with assistance from experts in related fields such as land surveyor and landscape architecture" needs clarification to determine its intended application, In many instances, it is not possible to apply this phrase as it is literally stated; for example, in this State, there is no registration of geologists and landscape architects are not prepared to provide the sort of services required by the Act.

Section 507(c)

This Section needs to be clarified so that it clearly expresses provisions to allow preparation of data for a cumulative impact assessment as well as the probably hydrologic consequences of a particular operation. This would include drilling and other costs.

Section 515(b)(12)

The requirement to refrain from surface coal mining within 500 ft. from abandoned underground mines is counter-productive to the nation's energy needs and does not recognize existing mining practices and secondary resource recovery. It has resulted in a particularly unuseful requirement regarding blasting within 500 ft. of inactive underground mines.

Section 515(b)(15)

The requirement of providing daily notice to residents/occupiers within one-half mile of a blasting site is cumbersome, redundant and of questionable additional value.

Section 521

The 90 day limitation can possibly be circumvented in instances where remedial action is carefully applied to the circumstances but many violations cannot truly be remedied within the 90 day period due to weather, labor strikes, and other things beyond the control of the operator and the Regulatory Authority.

Section 522

This section in general creates a serious question of condemnation without just compensation which the United States Supreme Court intends to review upon specific application of the requirements. Although police powers do necessarily require some infringement upon personal rights, this Section appears to be particularly repugnant to the concept of private property ownership and should not be necessary in light of the protective measures in this and other laws.

Section 522(e)(5)

This provision in particular seems unfair in its application in that many setbacks listed do not provide for a waiver by the owner of the property. If it is truly to protect the property owner, it seems that he should have some judgment about the need and desirability of this form of protection.

The Secretary has begun an approvable and advantageous approach to meet the goals of the Act. The vital interests of the States must be acknowledged to maximize regulatory efficiency. We firmly believe that any regulatory program which does not provide the needed flexibility will experience contempt from those upon whom it is enforced and frustration from those with the burden of its success.

Senator **Warner**. Congressman Wampler.

Mr. **Wampler**. Mr. Chairman, I want to thank Mr. Bowling for coming and to commend him for the fine work that the interstate mining compact is doing.

Mr. **Bowling**. Thank you.

Mr. **Wampler**. I know you haven't been in existence as long perhaps as other similar organizations, but we appreciate it.

Let me refresh my memory for a moment. As I recall, when we were debating the bill in the Congress, this question did arise in Pennsylvania about the cutoff date. I remember also that we were told that Pennsylvania had a model State law and that the Federal law was being fashioned greatly after the Pennsylvania law. So maybe the feeling was that they had no problem there and maybe they didn't need any money.

Mr. **Bowling**. If I could interject there. The people who were in Pennsylvania at that particular time, Pennsylvania was the only mining that they had seen, so I suppose they thought it was better than anybody else. I don't know.

Mr. **Wampler**. I was being facetious. [Laughter.]

We were told that was the model State law and the Federal law would be fashioned very much after that. If it is an injustice and inequity, it ought to be cured. You raise a very serious question.

Senator **Warner**. Thank you very much.

We will proceed with panel A witnesses.

The first will be Jackie Swigart, secretary of the Kentucky Department of Natural Resources and Environmental Protection; followed by Danny Brown, commissioner of the Division of Mine Land Reclamation of the Virginia Department of Conservation and Economic Development; Anthony Abar, director of the Maryland Bureau of Mines; and Arthur F. Nicholson, secretary of the Kentucky Coal Policy Council and commissioner of the Bureau of Energy Production and Utilization, Kentucky Department of Energy.

I would hope in view of the chairman's desire to put all statements in its entirety in the record, that each of the panelists can make a brief summary and then we can proceed to discussion of questions. Would you kindly lead off Ms. Swigart.

STATEMENT OF JACKIE SWIGART, SECRETARY, KENTUCKY DEPARTMENT FOR NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION

Ms. **Swigart**. Mr. Chairman, members of the committee, ladies and gentlemen, my name is Jackie Swigart. I am the secretary of the Kentucky Department for Natural Resources and Environmental Protection, which has jurisdiction over many natural resource programs including the surface mining program. On behalf of the Department and the Commonwealth of Kentucky, I wish to express our appreciation for this opportunity to present our views on various aspects of the Surface Mining and Reclamation Act of 1977 and its implementation.

The Commonwealth of Kentucky has a long history in the regulation of surface mining activities, with the first set of laws enacted in 1954.

The Department for Natural Resources and Environmental Protection, as the administrative agency charged with implementation of this law has had over 27 years of experience in this area. During that time, technological advances in the mining industry, increased education of the industry and the public, and a general growing concern for a healthy and safe environment have culminated into a fairly sophisticated and complex regulatory framework. In developing this complicated set of laws and regulations, we should take care not to lose sight of the fundamental, underlying rationale for the law, which is to provide a framework for the orderly extraction of minerals and the return of the land to a productive use.

As you know, Public Law 95–87 has an extensive legislative history and has undergone various changes in its development. The Commonwealth of Kentucky feels that the act itself is sound and should not undergo major alterations at this time. We feel that, by and large, the full impact of the act has not been put to test. In most instances, neither a full Federal program nor a delegated State program has been implemented for any length of time. There is little reason to reopen the national debate on the law until we have concrete information of its failure or its success. To perform major surgery on the enabling legislation at this time would, in our opinion, be a premature reaction.

However, should Congress deem it necessary to review the 1977 legislation, the Commonwealth of Kentucky would recommend some minor changes. One aspect of the law that might warrant closer scrutiny is the requirement for highwall elimination. There may be instances where granting a limited variance to highwall elimination to provide for flat land in parts of especially mountainous regions may be in order. The variance should, at a minimum, be tied to consent of the landowner and a post-mining land use which would require a flat area. Such a provisison, restricted in scope, would not contravene the public purpose of protection of our environment since in some special circumstances, partial elimination of highwalls may create a more stable environment than total elimination.

Turning to the act's implementation, we do have some concerns as a State which hopes to accept full delegation in the near future. One of these concerns focuses on the changing regulations. We appreciate the current administration's recognition of the diversity of the physical conditions of various regions and the resulting varying impacts of mining. As you know, Kentucky is already on record as arguing that State programs should be "as effective as" not "the same as" the Federal program. Therefore, we applaud the current effort to increase the flexibility of State regulatory methods while being no less effective in meeting the requirements of Public Law 95–87.

However, we do feel the Federal Government does have a legitimate role for the long-term oversight of delegated programs. This role should be of an auditing or factfinding nature. We do feel that dual inspections and dual policymaking would be duplicative and unnecessarily burdensome with little benefit to the operator, the regulatory agencies, or the taxpayer.

The Commonwealth understands the current administration's thrust to alter many regulations at this time. However, the Sttaes are in the unfortunate position of initiating operation of their permanent program before the process of rewriting the Federal regulations can be completed. While many of the changes being proposed are desirable, the Federal Government should clearly advise the States what impact it will have on a State's application for primacy under the timetable imposed by the act. Along this same line, there must be some thought given to the States ability to assimilate new proposals, adapt them to their particular circumstances and then rewrite the State regulations accordingly, given the shrinking State budgets.

Simultaneously with regulatory changes, there are several proposed modifications to the Office of Surface Mining's organization that have created quite a stir in coal States. It is Kentucky's understanding that while there is no plan set in concrete, OSM would like to replace the regional office structure with State offices and to alter locations for technical staff centers. The concept of State offices is clearly a workable solution if the purpose is to assist State regulatory agencies and perform an auditing function of programs. However, we feel the Federal offices should be located in close proximity to the State regulatory agencies to insure coordination and cooperation and avoid unnecessary bureaucratic costs to the taxpayers. As a case in point, the Kentucky office in my opinion should be located in Frankfort where the regulatory agency, the Department for Natural Resources and Environmental Protection is located, and not in Lexington. This is a commonsense approach, measured in dollars or in political philosophy.

The location of technical staffs should also follow the commonsense approach. The Federal Government should build up the necessary research tools and technical staff to answer questions and investigate special problem areas for the States, which have limited resources to engage in such pursuits. Centralized offices should be created in areas within easy transportation access by States and as near to high concentration of mining activities as possible. It is incumbent upon public employees as managers of the taxpayer's dollars to spend them as wisely as possible.

The bottom line on any reorganization efforts is to make the organization as effective as possible and not to have an adverse impact on enforcement. Therefore, the technical services staff should be retained, as well as a sufficient number of other staff with expertise to perform the Federal Government's function, whether it be full implementation or that of an oversight role.

One very critical area that should not be overlooked in the shuffle is the timely distribution of accumulated abandoned lands funds to States which have received primacy. There is concern at the State level over the current status of these State-generated moneys and their ultimate disbursal back to the States. We would urge the committee to pay special attention to this area.

In summary, the Department for Natural Resources and Environmental Protection does look forward to the challenge of accepting primary responsibility for the administration of Public Law 95–87 in Kentucky. We would urge that the regulatory climate be stabilized as soon as possible so that the industry can get on with the business of mining coal, the public can be assured a reliable legal framework and the regulatory agencies can perform their respective duties. It is not imperative that the act be reopened at this time for legislative change. Such regulatory changes as are necessary should proceed in a more timely fashion with clear direction to all concerned parties of their impact. Any administrative changes contemplated should only be made in the best interest of effective enforcement of Public Law 95–87 and with prudent management of public dollars in mind. In the final analysis, laws and regulations may become paper tigers if the resources to effect them are missing.

I thank the committee for its attention and consideration to these concerns. My Department would be pleased to provide further detailed information on these matters if desired.

Senator **Warner**. Thank you, Ms. Swigart. I am informed that you have a national reputation and that your words are listened to very carefully as we have taken them into consideration also today.

I would like to say that Senator Wendell Ford of your State, a very active member of the Senate Energy Committee, and my predecessor as chairman of the subcommittee, and also Senator Huddleston, have had the privilege and pleasure of working together in all issues relating to coal and I might add tobacco. [Laughter.]

Mr. **Wampler**. Ms. Swigart, I want to thank you for what I perceive to be an excellent statement. You have expressed many of my concerns and sentiments. The Ninth Congressional District that I am privileged to represent in Congress borders the Commonwealth of Kentucky for well over 100 miles, and I have had a long and pleasant relationship with your congressional delegation. But on occasion, as a good Virginian, I have to remind my colleagues from Kentucky that the Commonwealth of Kentucky at one time was a part of one of the counties that I now represent.

We are delighted that you became a Commonwealth, a sister Commonwealth. We have many problems in common, and the border and counties of southeastern Kentucky are similar in terrain to those of southwest Virginia. We do enjoy a lot of common problems, in agriculture, coal mining, and commerce. We are delighted with our long friendship and we are glad that our child, so to speak, is doing well.

Ms. **Swigart**. Thank you. I, too, have enjoyed a pleasant relationship with the Commonwealth of Virginia.

Senator **Warner**. Any common problems in moonshining, Congressman? [Laughter.] Which is the better brand?

Mr. **Wampler**. It is all good, some better than others.

Senator **Warner**. As I understand our next witness is in place of Mr. Nicholson of the Kentucky Coal Policy Council. Would you identify yourself.

STATEMENT OF WILLIAM BOWKER, KENTUCKY COAL POLICY COUNCIL

Mr. **Bowker**. Thank you, Senator. I am William Bowker. I am Mr. Nicholson's executive assistant. He sends his regrets. At the last minute he had to change his plans. He is secretary of the Kentucky Coal Policy Council, in addition to being commissioner of the Bureau of Energy Production and Utilization in the Kentucky Department of Energy.

Along with your request, I will try to summarize.

Senator **Warner**. We will accept his statement for the record in its entirety and recognize you are here to submit it.

Would you like to make any observations?

Mr. Bowker. If you wish, I will summarize the high points and do it very briefly.

I would like to say that the Kentucky Coal Policy Council is a group of 33 leading persons in the coal industry, other energy industries, transportation, finance, education, and State government. It was created by Gov. John Y. Brown, Jr., in June 1980. It has been a very active working group. Secretary Swigart is one of our esteemed members and works very closely with the Coal Policy Council.

The council did want Art to come, Commissioner Nicholson to come and express some concerns. I will point these out very quickly.

First of all, the council supports and applauds many of the actions being taken by the Department of Interior and Office of Surface Mining. The reorganization, the very close look that is being taken at certain of the regulations that have been in the past burdensome, counterproductive or perhaps somewhat untenable in some of the States.

Very quickly I point out that we do have some continuing concerns, that some of these have been spoken to today. I am very pleased, of course, that Mr. Harris apparently has some of these under very close advisement at the present time. These concerns are, first, the fact that the act has been interpreted as allowing OSM to impose nationally uniform design criteria through which performance standards are to be attained.

Second, in the lack of variances from certain performance standards and, third, in the Department of the Interior authority to invalidate a State's program without proper judicial action.

Again, summarizing, I think the problem of design criteria is well known. Very often, as we pointed out in our statement, design criteria have been established through regulation which may be appropriate for the Western United States and Midwest, but are not appropriate for the Appalachian area. This, I think, is well known.

We believe in terms of the Department of the Interior's ability to invalidate a State's program, that the Secretary of the Interior should invalidate a State program only if a court of competent jurisdiction finds that the State program does not comply with the purposes of the act.

We believe that if a State is not fulfilling its obligation, the obligation of its own statutes or Federal statutes, they should not be allowed to function in a regulatory manner.

We believe the judgment as to whether a State has abrogated its responsibility should not be left to that Federal agency which will assume these responsibilities, given a negative finding.

Concerning compliance with environmental performance and standards or waivers of this, the Kentucky Coal Policy Council recommends that the act be amended to authorize State regulatory agency to waive compliance with environment performance and standards, if an operator can show that alternate procedure through a postmining land use plan will restore the land to a condition capable of supporting premining uses or higher or better uses, and will create no actual environmental harm or public safety or welfare hazard.

We have given in our statement several examples and I won't go into those right now.

One point that we would like to make concerning performance standards, we believe that in the interest of adding incentive to improve abandoned mine lands and to maximize resource recovery, the act should be amended or proper regulatory action should be taken to specify that high wall elimination is not required under certain situations. Particularly we have in mind here a case in which an operator wishes to take a second cut or to auger on an existing highwall. Again, the problem with this is detailed in the paper.

We believe that if under these conditions an operator may not be required to completely eliminate the highwall, it may be able to recover coal or to improve land that otherwise he could consider uneconomic to do.

We believe that a section of the act, 507(b)(11) pertaining to the determination of probable hydrologic consequences should undergo substantive revision to clarify and narrow its requirements. I won't give the details, but the requirements have been confusing and overly detailed.

We believe that section 518(c), "escrowed penalties," should be reexamined and adequate revision must be made to safeguard against any unfair procedures and possible violations of due process.

In closing, Senator Warner and Representative Wampler, the Kentucky Coal Policy Council supports the need for responsible surface mining and reclamation practices which minimize environmental impact. Mining operations can and should be allowed to have positive impacts on our land by creating more valuable land in concert with the mining operation.

Thank you.

[The prepared statement of Mr. Nicholson follows:]

COMMENTS ON THE SURFACE MINING CONTROL AND RECLAMATION ACT

STATEMENT FOR THE HEARINGS ON
THE SURFACE MINING CONTROL AND RECLAMATION ACT

RICHLANDS, VIRGINIA
SEPTEMBER 2, 1981

UNITED STATES SENATE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
SUBCOMMITTEE ON ENERGY AND MINERAL RESURCES
JOHN W. WARNER, CHAIRMAN

BY

ARTHUR F. NICHOLSON
SECRETARY
KENTUCKY COAL POLICY COUNCIL

COMMISSIONER
BUREAU OF ENERGY PRODUCTION AND UTILIZATION
KENTUCKY DEPARTMENT OF ENERGY

I am Arthur F. Nicholson, Commissioner of the Bureau of Energy Production and Utilization in the Kentucky Department of Energy, and Secretary of the Kentucky Coal Policy Council. The Kentucky Coal Policy Council, consisting of thirty-three leading persons in the coal industry, other energy industries, transportation, finance, education, and state government, was created by Governor John Y. Brown, Jr., in 1980. The Council is an active working-group, striving to assist the coal industry in dealing with problems of production, marketing, transportation, and regulation. On behalf of the Kentucky Coal Policy Council, I appreciate this opportunity both to applaud certain new directions in the U. S. Department of Interior and its Office of Surface Mining and to express concern over certain aspects of PL 95-87 and the regulations implementing it.

We support the proposed reorganization of the Office of Surface Mining (OSM) which we believe will better allow OSM to assume the oversite role while allowing the states to retain the primary responsibility for implementation of the Act. We commend the Department of the Interior for re-examining the regulations and changing regulatory provisions which are excessive, burdensome or counter-productive. The new directives being considered for state implementation by OSM and the Department of the Interior should greatly enhance the development of, and give flexibility to, our state program.

Our concerns are in the Act's being interpreted as allowing OSM to impose nationally uniform design criteria through which the performance standards are to be attained, in the lack of variances from certain performance standards, and in the Department of the Interior authority to invalidate a state's program without proper judical action.

Nationally uniform design criteria fail to consider important regional and site differences and preclude an operator from demonstrating that he can satisfy required performance standards more efficiently and cost-effectively at a particular mine site. Therefore, the Act should be amended to allow operators to achieve required levels of performance standards in the most cost-efficient way.

SMCRA should be amended to allow the Secretary of the Interior to invalidate a state program only if a court of competent jurisdiction finds that the state program does not comply with the purposes of the Act. We contend that the states must be granted the flexibility to develop their own regulatory programs in accordance with the purposes of the Act, while developing regulatory programs which are tailored to specific needs of a particular region or state. Obviously, if any state is not fulfilling the obligations of its own statutes or of federal statutes, it should not be allowed to function as a regulatory entity. However, the judgment as to whether or not a given state has abrogated its responsibilities should not be left to that federal agency which will assume those responsibilities, given a negative finding.

The Kentucky Coal Policy Council recommends that the Act be amended to authorize state regulatory agencies to waive compliance with environmental performance standards if an operator can show that an alternate procedure, through a post-mining land-use plan will restore the land to a condition capable of supporting pre-mining uses or higher or better uses and will create no actual environmental harm or public safety or welfare hazard. More specifically, we contend that variances from the highwall elimination and approximate original contour (AOC) requirements of section 515(b)(3) should be allowed upon a showing of approvable short-term or long-term land use and with landowners' consent. We also believe that the section 515(e) requirement that the watershed be improved as a condition of AOC variance should be eliminated and that AOC variances be available on non-steep slope mining. The currently available variance, limited to steep slope areas, allows very little flexibility for land use improvement.

In the interest of adding incentive to improve abandoned mine areas and to maximize resource recovery, the Act should be amended to specify that highwall elimination is not required under certain situations. Clarification is particularly needed on the subject of an operator's wishing to take a second cut, or to auger on an existing highwall. OSM regulations have required, under such conditions, that operators completely eliminate the highwall although sufficient spoil may not be available to do so. Hence, such an operation would be uneconomic or unfeasible, and such abondoned lands would remain unreclaimed and resources would remain undeveloped.

We contend that section 507(b)(11) pertaining to the determination of probable hydrologic consequences should undergo substantive revision to clarify and narrow its requirements. Also. variances should be allowable if the applicant demonstrates, and the regulatory authority concurs, that acquisition of portions of the otherwise required hydrologic data is not necessary for determining probable cumulative impacts.

We also contend that section 518(c) "Escrowed Penalties" should be re-examined and an adequate revision must be made to safeguard against any unfair procedures and possible violations of due process. The Supreme Court labeled its own decision on this matter as premature, and left it open for future litigation on the validity of the procedure. Thus, we contend that this may infringe upon the due process right of operators and will cause undue hardships for many of Kentucky's small operators.

The Kentucky Coal Policy Council supports the need for responsible surface mining and reclamation practices which minimize environmental impacts. Mining operations can and should be allowed to have positive impacts on our land by creating more valuable land in concert with the mining operation.

Senator **Warner**. Thank you very much.

Our next panelist is Mr. Abar.

STATEMENT OF ANTHONY F. ABAR, DIRECTOR, MARYLAND BUREAU OF MINES

Mr. **Abar**. Senator Warner, Congressman Wampler, I am Anthony F. Abar, director of the Maryland Bureau of Mines.

I am going to deviate drastically from my prepared presentation, with the hope it will be brief.

I had intended to limit the majority of my testimony to specific suggestions for amendments to the Federal Surface Mining Act.

Attached to my prepared statement is a list of the specific sections and subsections of Public Law 95–87 that we believe to be amended, either deleted or revised, along with a very brief rationale for that.

The body of my paper really is focused in on about six or seven things of what we consider to be prime examples in the act of either excessive, counterproductive, or unnecessarily burdensome regulations.

I will try to briefly summarize each of those examples.

The first one, the requirements of 507(b)(11) for "probable hydrologic consequences" to be submitted by the operator or the applicant and probable cumulative impacts would be accomplished by the regulatory agency.

I think that the general nebulous requirements of that particular section should be deleted and in their place something more practical, more pragmatic should be substituted; namely, a determination of what is going to be the impact upon water users or users. Is there a potential for any adverse impact? If so, is there an alternate that could be brought on line, if that potential, in fact, is realized.

This is an approach we have been taking in our State for several years with success, without the cost involved in that particular section.

I pointed out that this section is extremely costly, not only to the operator, but to the Government, due to the provisions of the small operator's assistance program, or SOAP.

I suggest that this particular money that Congress authorized could be better spent in developing the State of the art hydrogeologic modeling.

They just don't exist. We can collect data that shows it is costly and massive. We do not have the means that we can plug that data into and confidently predict what is going to happen. I think this is a prime example of where both the applicant and the State, regulatory authorities are being asked to accomplish something that the prior state of the art can be attained.

My next point is the 5-year bond period. I recommend that be reduced to a 2-year bond holding period, at least to the East. I have had a great deal of experience within Maryland for at least since 1972. We have not found problems with revegetation deterioration, dying off, if it has been doing well for a couple of years. The current 5-year period denies the landowner of the enhanced productivity, because it really inhibits putting fertilizer or lime on the soil or you jeopardize the bond reduced period.

The second thing, it really is a disincentive to establish real quickly new vegetation. Why do it in 2 years, if you are going to have 5?

The third point I make is mandatory civil penalties of the act. I just am convinced in a very short time, actually 2 years, it seems like a lifetime, we have been living with this act, the mandatory penalties are just not worth it. I believe the State should have more flexibility to determine what is the best way to achieve compliance.

Related to that is the 90-day maximum period in the act for accomplishing correction of a violation. Most violations should be corrected well within that, but there are going to be some times when that is not going to be possible. I am afraid that we could get into a haste makes waste situation where in order to meet that arbitrary deadline, the operator proposes, the regulating authority approves, and then is implemented a less than optimum solution.

Another one, and I think one that is real important, is that all, the provisions in the act that all spoil material be disposed on permitted and bonded areas. Now the Office of Surface Mining is working on some of the problems that you discussed earlier in this hearing on remaining old areas and reclaiming them and the abandoned mines program is only going to provide points for a small fraction of what needs to be. Some of the regulations and changes are in the right direction of at least getting some reclamation gratuitously in conjunction with new mining.

One practice that is common in Appalachia and northern Appalachia is to use spoil that is not needed to achieve the original contour to reclaim a lower bench, another bench, without ever mining it. It is a good place to put it, but you are really creating a disincentive, if that area has to be permitted and bonded.

I suggest perhaps a constraint on an exemption so that at least will allow if it is part of an AML project, a State or Federal AML project.

Turning to examples that I consider burdensome, one is the land unsuitable for this. I feel this planning process that was set up there, for the most part, can be handled and in the permit review process.

Second, I feel that it can be easily subverted. An example, you could designate an area not suitable because of historical or archeological resources, but nothing prohibits from coming in and destroying it. The landowner could come in and mine it, take the topsoil and what have you got? It is an easily subverted section. It is very cumbersome.

The petition review process, I related to that such of the arbitrary restrictions within certain distance of what are private properties, absolutely prohibition to consider something like this could be better left for the State and local and private divisions.

Another one, I just do not believe we need to have environmental impact statements or assessments required for every abandoned mine reclamation project that we take up in the State. You are going to have prefunctory statements prepared by the State, reviewed by the Office of Surface Mining, in which any short-term adverse impacts will be far outweighed by the long-range beneficial impact. I recommend that we except them from the requirements.

Very quickly, I mentioned a number that I do not feel as a regulatory agency would derive any benefit from the cost placed on the applicants, such as requiring a 3-year history of all violations, a listing of all permits in the entire United States, 5-year term on permits, and detailed time schedules. We just do not feel that these contribute to our regulatory programs.

I close in general by saying that we have been through 4 years of confusion and turmoil, court suits at the district level, circuit court, courts of appeal, Supreme Court—we have had approved programs, now we have been enjoined. We try to follow the said regs. I listed in here in a 25-month period approximately 2 years from June of 1979 through 1981, I counted 75 Federal Register notices that were in it, and that didn't include those that applied to just an individual State. I don't think anybody is fully cognizant of the full Federal regulations right now. I don't have a specific suggestion there, but I do ask that you consider the act and revise it, that you also consider granting us some form of relief. I think we all need a break. I do. That is all. [Applause.]

[The prepared statement of Mr. Abar follows:]

TESTIMONY OF ANTHONY F. ABAR
BEFORE THE SENATE SUBCOMMITTEE
ON ENERGY AND MINERAL RESOURCES

September 2, 1981

Mr. Chairman, and members of the Committee, my name is Anthony F. Abar. I am the Director of the Maryland Bureau of Mines.[1]

The announced purposes of this hearing include: a review of the current status of implementation of the Federal Surface Mining Act, the current proposed reorganization of the Office of Surface Mining, the regulatory agenda at OSM, and the status of State programs. I will limit the majority of my testimony to specific suggestions for amendments to the Federal Surface Mining Act.

The Office of Surface Mining is in the midst of promulgating substantial revisions to the Federal Surface Coal Mining and Reclamation regulations. However, it is not necessary, or desirable, to wait until OSM's regulatory revision process has been completed before Congress considers amendments to the Act.

I have submitted an attachment to my testimony which identifies those sections and subsections of PL95-87 that we believe should be deleted or modified, together with a brief rationale for each recommended change. My testimony focuses on several of those recommended changes which are prime examples of excessive or counterproductive provisions of the Act. These provisions of the Act require procedures, practices, or performances--of both coal operators and regulatory agencies--that are far from the most cost-effective approach to achieving the underlying goals and objectives to the Act. In some instances, they work counter to achievement of those goals and objectives; and, in other instances, they are infeasible to attain, given the state of the art.

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[1] The Maryland Bureau of Mines is an agency of the Maryland Department of Natural Resources. The Maryland Department of Natural Resources is the agency designated by the Governor to administer a surface coal mining control and reclamation program in accordance with the provisions of the Federal Surface Mining Control and Reclamation Act of 1977.

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(1) Section 507(b)(11) requires a determination of "probable hydrologic consequences" by a permit applicant, as input to an assessment of the "probable cumulative impacts" of all anticipated mining in an area by the regulatory authority. This subsection should be deleted; and more feasible and less nebulous determinations should be required, specifically: (1) a determination of the probable impacts of the mining operation on the quantity and quality of surface and ground water; (2) a determination of the potential impacts on present water uses; and (3) a determination of alternate sources of water when protection of present water users cannot be assured.

The "state of the art" does not permit confident determinations of probable hydrologic impacts as required by Subsection 507(b)(11). Hydrogeologic models have not been developed that can quantitatively predict the required cause-effect relationships, regardless of the amount of data available. Yet, we are currently engaged in massive, extremely costly data collection activities that generate data that is extraneous to the requirements of the Act [Section 508(a)(13)] to protect ground and surface water and the rights of present users of such water.

Section 507(b)(11) is costly to permit applicants--and government due to the provisions of the Small Operator's Assistance (or SOAP) Program--and does not contribute to improved regulatory decisions. The monies that Congress has authorized for the SOAP program could be better spent on research and demonstration programs to develop the state of the art of hydrogeologic modeling, including grants to state regulatory agencies to selectively monitor and model permits, regardless of size.

Section 507(b)(11) is an example of a requirement of the Act with which it is not feasible for either the permit applicant or the regulatory agency to comply.

(2) Section 515(b)(20) requires mine operators to assume the responsibility for successful revegetation for a period of five years (ten years in the west) after the last year of augmented seeding, fertilizing, or other revegetation efforts. We recommend changing this five year period to a two year period.

As written, this section denies the landowner enhanced crop production, by deterring the periodic application of lime and fertilizer that could jeopardize bond release. The five year bond holding period also reduces the incentive for rapid establishment of adequate revegetation. Two years of successful revegetation has been demonstrated to be an adequate evaluation period to determine vegetative viability in most sections of the country.

The five year bond holding period, when combined with the requirements of Section 519(c)(2) to meet applicable suspended solids standards prior to bond release has virtually closed the surety bond option for small coal operators. Small operators are, therefore, required to place certificates of deposit as performance bonds for their permits. The effect is to reduce their operating capital available for mining and reclamation efforts on the ground. This situation is exacerbated by the penalty provisions of the Act.

(3) Sections 518(a) and (h) require mandatory civil penalties when a regulatory authority issues a cessation order or when operators fail to correct violations within the time periods specified for their correction. We recommend deleting these mandatory penalty provisions. Similarly, we recommend deleting Section 518(i) and Section 521(d), which require states to develop enforcement and penalty provisions that are no less stringent than the provisions of the Federal Act. State regulatory authorities should have more flexibility to determine

effective compliance measures.

I am convinced that the penalty approach emphasized in Section 518 of the Act is generally ineffective. Further, payment of mandatory penalties may be counterproductive. Many operators may not be able to pay a severe penalty and, at the same time, pay for required compliance measures.

(4) Section 521(a)(3) should be modified to delete the 90 day maximum period for correction of a violation. The Office of Surface Mining has recently adopted regulations providing for exceptions to the 90 day maximum compliance period. However, this statutory provision should be deleted.

Most violations should be corrected in much less than 90 days. However, there may be instances when the proper correction of severe violations will require more than 90 days to design and implement. Retention of the 90 day maximum compliance period could result in "haste-makes-waste" situations, as, in the rush to achieve compliance, less than optimum solutions are proposed, approved, and implemented.

(5) Sections 515(b)(21) & 515(b)(22)(B) require all spoil material from an active mine to be deposited within bonded permit areas. We recommend a statutory exception to this requirement when the spoil material would be used to reclaim an abandoned mine. The requirements of these subsections have inhibited the practice of reclaiming abandoned mines utilizing excess spoil from a nearby active mine. Allowing such a practice, without permitting and bonding the abandoned

mine, affords the opportunity to obtain significant gratuitous abandoned mine reclamation. The exception might include a constraint which would authorize this practice only when the abandoned mine reclamation effort is accomplished under an AML Contract.

(6) Subsections (a), (c) and (d) of Section 522 require a burdensome "planning" process to facilitate decisions by the regulatory authority regarding designation of areas as unsuitable for surface mining, in response to petitions from interested parties. We recommend that these subsections be deleted. The permit application evaluation process can address the concerns listed in these subsections without the costly data bases and inventories required by Section 522(a)(4) and the cumbersome petition review process. Further, by "protecting" areas from coal mining operations only, these subsections may be ineffective in achieving their objectives, and may be easily subverted. For example, they do not prevent the destruction of "designated" historic or cultural resources prior to coal mining (by property owners or others) for other purposes, and subsequent coal mining operations.

Congress has enacted many laws to protect historical and archeological resources, rare and endangered species and other valued national assets. State and local governments have programs to protect, for example, water resources, flood plains, and agricultural lands. Many local governments have enacted land use plans and ordinances which control surface coal mining as well as other land uses. The marginal value of these provisions of Section 522 is doubtful, at best.

In addition to the provision of the Federal Surface Mining Act that are excessive or counterproductive, there are numerous requirements that are burdensome on regulatory agencies and permit applicants and that provide little, if any, contributions to the objectives of the Act. Examples include Sections 507(b)(3), and 510(c), which require the applicant to identify all currently and previously held permits, and the status of all violations incurred during a three year period, in the entire United States. This information may be quite voluminous, burdensome to the applicant, and useless to the regulatory agency reviewing the application.

Similarly, the term (life) of the permit, specified in Section 508(a)(3), and the detailed timetable requirement in Section 508(a)(7) might be better left to the discretion of the State regulatory agencies. In Maryland, we have not found either provision to be a desirable requirement. Given the five year bond holding period, all permits will have to be renewed at least once; and, given many uncertainties, a detailed timetable is subject to frequent changes, and is of no value. We consider both requirements to be unnecessary burdens.

To eliminate an administrative burden in Title IV, the Abandoned Mine Reclamation Program, we recommend amending

Section 405 to exempt state reclamation projects from the requirements of the National Environmental Policy Act of 1969. The exemption should include a specific statement in Section 405(f) that, "Environmental Assessments and Environmental Impact Statements shall not be required for individual reclamation projects." Environmental assessments/impact statements are unnecessarily burdensome given the nature of abandoned mine reclamation projects. Substantial time and money will be wasted drafting and reviewing perfunctory environmental assessments for projects in which any short term adverse impacts will be far outweighed by the long range beneficial impacts.

I would close on a more general note. Since August, 1977, we have experienced interim program regulations; permanent program regulations; court suits in the District Court, Court of Appeals, and Supreme Court; and State program injunction. Many sections of the federal regulations have been remanded, suspended, or otherwise proposed for revisions.

Our agency has tried to "track" the Federal Register in an attempt to keep abreast of proposed and actual changes to the Federal Surface Mining Program. We are far from confident that we have caught each Federal Register entry. However, since October, 1977, we have noted 90 (ninety) such entries (a listing of Register dates is attached). During a two-year period, from June 1979 through June 1981, we noted 75 (seventy-five) entries in the Federal Register that pertain to the Federal Surface Mining Control Program--not including announcements limited to individual states, such as state program approval or cooperative agreement approval notices. In short, for the past several years, we have experienced turmoil and confusion.

The current administration is in the process of further amending the Federal program regulations. We generally support the current administration's efforts to revise the existing regulations. However, we do ask: What can be done to alleviate the confusion that exists and will probably increase for some time to come?

I do not believe anyone is fully cognizant of the current operative federal regulation. This situation is having, and will continue to have, serious detrimental impacts on state regulatory program efforts. I do not have a specific recommendation. However, I request that you give serious consideration to some form of relief.

Recommended Revisions
Surface Mining Control and Reclamation Act (PL 95-87)

Section Number	Recommended Change	Rationale
402(g)(2)	Revise last sentence which provides for reversion of funds that have not been expended within three years; change to obligated within six years	Complex abandoned mine reclamation projects may take several years to plan, design, and implement. The current statutory language makes program planning and budgeting for abandoned mine reclamation extremely uncertain. Budgets cannot be formulated and contracts cannot be executed with certainty that the Federal funds will be available when needed to implement the reclamation projects.
405(f)	Revise by adding statement: State Programs and specific reclamation projects shall be deemed not to be major Federal action within the meaning of Section 102 (2)(c) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332). Environmental Assessments and Environmental Impact Statements shall not be required for specific reclamation projects.	Environmental Assessments/Impact Statements are unnecessarily burdensome given the nature of abandoned mine reclamation projects and the information otherwise required under Section 405(f). However, OSM has determined that Environmental Assessments are required and Environmental Impact Statements may be required. Section 501 provides a NEPA waiver for the interim program regulations, which were more significant.
503(a)(7)	Delete	Requiring State Programs to be in accordance with Sub-sections 502(a) (1 through 6) will meet the objectives of the Act while providing the States the flexibility to design a program that addresses "local" conditions
506(a)	Revise as follows: A person conducting surface coal mining operations under a permit from the State regulatory authority, issued in accordance with the provisions of section 502 of this Act, or conducting surface coal mining operations prior to the date a State program is approved that were not regulated by the State prior to program approval, may conduct such operations beyond such period if an application for a permit has been filed in accordance with the provisions of this Act, but the initial administrative decision has not been rendered	Several states did not regulate all of the types of activities included in the definition of surface coal mining operations prior to approval of their programs. Requiring such operations to cease because the Regulatory Authority has not rendered a decision, although the applicant submitted a permit application, would be unfair and punitive.

Section Number	Recommended Change	Rationale
506(b)	Delete	Placing a five year term on permits and, therefore, requiring permit renewal, is burdensome to permittees and Regulatory Authorities, and serves no useful purpose. Given the bond holding period, all permits will have to be renewed at least once.
507(b)(3)	Delete	This information is not useful to the Regulatory Authority and is burdensome to the applicant. Subsection 507(b)(5) is adequate for the Regulatory Authortiy to reach a decision.
507(b)(8)	Delete	The uncertainties of the market (demand), weather, etc., make the schedules required by Section 507(b)(8) extremely hypothetical, subject to frequent change, and of no value to the Regulatory Authority.
507(b)(11)	Delete and substitute the following: A determination of the probable impacts of the mining and reclamation operation on the quantity and quality of surface and groundwater both on and off the mine site; a determination of the potential impacts on present water uses and a determination of alternative sources of water when protection of present water users cannot be assured.	The "state of art" does not permit confident determinations of probable hydrologic impacts as required by Sub-section 507(b)(11). That, is, hydrologic models have not been developed that quantitatively predict cause-effect relationships, regardless of the amount of data available. This provision is costly to permit applicants (and government due to the provisions of Section 507(c)) and does not contribute to improved decisions. The recommended revisions (a) will be less costly and more cost effective, (b) relate directly to the requirements of 508 (a)(13), (c) are reasonably feasible determination given the state of the art, (d) eliminate many ambiguities of the present Section 507(b) (11), and (e) should reduce extraneous data collections and analyses.

Section	Recommended Change	Rationale
508(a)(3)	Revise as follows: the use which is proposed to be made of the land following reclamation, and a discussion of the capability of the reclaimed land to support the proposed post mining use.	The current provisions of Section 508(a)(2) require voluminous extraneous information which constitute a burden on the applicant and the regulatory authority.
508(a)(7)	Delete	Given the many uncertainties, a detailed timetable is subject to frequent and significant change; and is of no value to the regulatory authority.
508(a)(11)	Delete	Unnecessary. See also comments under 508(a)(3).
508(a)(12)	Revise to make this requirement optional, "when required by the regulatory authority".	See also comments under 507(b)(15).
510(b)	Delete requirement that the regulatory authority find "in writing".	The requirement is burdensome; and, if the applicant does not provide the required demonstration, the regulatory authority will not approve the application. A written recapitulation by the Regulatory Authority adds nothing, is time consuming, and costly.
510(c)	Delete	The required information is extraneous. The requirement of 507(b)(5) is adequate.
515(b)(5)	Revise to require topsoil stockpile cover, when required by the regulatory authority	In many instances, requiring topsoil seeding, or other cover, is unnecessary since wind/water erosion potential is insignificant. States have historically required topsoil segregation without requiring stockpile covering. Careful segregation and replacement is far more significant to topsoil conservation.

Section	Recommended Change	Rationale
515(b)(10)(B)(i)	Revise by deleting phrase "using best technology currently available" and the phrase "but in no event shall contributions be in excess of requirements set by applicable State or Federal law.	These phrases have resulted in requirements to pass all drainage through sediment ponds and to meet effluent limitations established for "point source" discharges. Studies funded by OSM have found that "best technology currently available" cannot guarantee achieving point source effluent limitations.
515(b)(10)(D)	Delete	This requirement is probably impossible to attain and serves no useful purpose in many instances.
515(b)(12)	Revise by deleting "abandoned" underground mines and everything following "B".	Abandoned underground mines do not constitute a hazard to underground miners. Consequently, this requirement is unncessarily burdensome. Also, Section B requirement will always be satisfied - ie., "result in improved resource recovery".
515(b)(20)	Revise by changing five full years to two full years.	Five years is an excessively long liability period; and, as written, this section denies the landowner enhanced crop production by deterring fertilizing, irrigation, etc. Two years is long enough to determine vegetative viability.
515(b)(21)	Revise by adding the following: Provided, spoil material may be placed off a permitted area when it will be used to reclaim an abandoned mine, without permitting and bonding the abandoned mine, when the abandoned mine reclamation effort is accomplished: (a) Under an AML Contract pursuant to Title IV of PL 95-87. (b) Under an abandoned mine reclamation contract funded by other public revenue sources. (c) With the approval of the regulatory authority, when the regulatory authority has determined that "spoiling" on the abandoned mine is not necessary to the mining and reclamation operation under permit and "borrowing" spoil from the permit area will not violate reclamation standards.	The current language of 515(b)(21) has prohibited a very beneficial abandoned mine reclamation practice, covering old highwalls with excess spoil from a nearby active mine.

Section	Recommended Change	Rationale
515(b)(22)(B)	Revise in accordance with comments under 515(b) (21).	See comments under 515 (b)(21).
515(b)(25)	Delete	Ambiguous and unnecessary. The Regulatory Authority could require barriers or other slide and erosion control measures, if needed.
515(c)(4)(A)	Delete	The requirement is not necessary in all instances. The Regulatory Authority could require barriers when necessary.
515(e)(1)	Delete "provided that the watershed control of the area is improved"	Excessive constraint; as long as watershed control is not adversely impacted.
515(e)(3)(c)	Delete	See comments under 515(e)(1).
516	Revise	Corresponding changes to those recommended Under Section 515.
518(c)	Delete the requirement of pre-payment of penalty into escrow account in order to appeal.	This assumption could constitute a violation of the fifth amendment of the Constitution of the United States and is contrary to all existing court procedures.
518(h) & (i)	Delete or revise to include other methods such as revocation	Gives the Regulatory Authority more flexibility.
521(a)(3)	Delete "but not more than 90 days"	Gives the Regulatory Authority the authority to solve more severe violations which may require more than 90 days to correct because of conditions such as severe weather.
521(d)	Delete	Gives Regulatory Authority more flexibility.

Section*	Recommended Change	Rationale
522(a)(c)(d)	Delete	These sub-sections require a burdensome "planning" process. The permit application evaluation process can address the concerns raised in these sub-sections without the costly data bases and inventories required by 522(a)(4). Further, by "protecting" areas/resources from coal mining operations only, these sub-sections may be ineffective and easily subverted. For example, they do not prevent the distruction of a "designated" historic or cultural resource by a property owner and subsequent coal mining operation by an operator.
522(e)(1)	Delete including study rivers designated under Section 5(a) of the Wild and Scenic Rivers Act.	These areas include private land.
522(e)(5)	Revise to provide a waiver for the entire section.	A waiver would allow the Regulatory Authority to issue mining permits when requested/approved by the owners.
701(28)	Revise to include only those operations at the mine site.	The current definition is ambiguous and has resulted in uncertainties and burdensome litigation. Further the definition includes activities and areas that are not sufficiently significant to require environmental controls beyond water/air pollution laws and regulations. Narrowing the focus of regulatory authorities would reduce their costs and improve their effectiveness.

DATES OF FEDERAL REGISTER NOTICES

PERTAINING TO REGULATIONS PURSUANT TO PL95-87

1. 10/20/77
2. 3/13/79
3. 5/25/79
4. 6/11/79
5. 6/18/79
6. 6/22/79
7. 6/29/79
8. 8/ 1/79
9. 8/15/79
10. 8/24/79
11. 9/19/79
12. 9/25/79
13. 9/28/79
14. 10/18/79
15. 10/22/79
16. 10/24/79
17. 11/27/79
18. 12/11/79
19. 12/19/79
20. 12/31/79
21. 1/ 3/80
22. 1/11/80
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90. 8/19/81

Senator WARNER. Thank you very much. [Applause.]

You struck a responsive chord.

Now, Mr. Brown, we are privileged to have you as the representative of this State of Virginia. You have one of the largest statements here. In view of the hour, I would hope you can touch the high points.

Mr. BROWN. Yes, it would be difficult to brief it. I have a lot of things to say.

Senator WARNER. We had a long time yesterday and that helped.

STATEMENT OF DANNY R. BROWN, COMMISSIONER, DIVISION OF MINED LAND RECLAMATION, VIRGINIA DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

Mr. BROWN. Mr. Chairman, and members of the committee, my name is Danny R. Brown. I am commissioner of the division of mined land reclamation of the Virginia Department of Conservation and Economic Development. On behalf of the Commonwealth of Virginia, I would like to thank you for this opportunity to address the Energy and Mineral Resources Subcommittee on the Surface Mining Control and Reclamation Act of 1977.

Since the enactment of the law and the implementation of the interim regulatory program, the Commonwealth of Virginia has endeavored to institute a permanent regulatory program under section 503 of the act in order to assume primacy in the regulation of its coal industry. As the State tailored its program to meet Federal requirements, we attempted to address certain portions of the act, which made unreasonable or inequitable demands on the southwest Virginia coal industry.

Requirements dealing with groundwater data collection, topsoil removal, haulroads, lands unsuitable for mining, sedimentation ponds, disposal of excess spoil and backfilling and grading of previously mined areas were dealt with through the so-called state window approach with the intent of providing alternative regulations which took the unique geologic and topographic conditions present in southwest Virginia into consideration. All of these alternatives as well as other permanent program provisions were disapproved by former Interior Secretary Andrus in October of 1980 as being in conflict with the provisions of the act.

In light of this, and the State's participation in the lawsuit heard before the U.S. Supreme Court regarding the constitutionality of the Federal requirements, the new philosophies currently espoused by the Office of Surface Mining are extremely welcome in Virginia. We heartily support the new philosophies which hopefully give each State much more flexibility in determining the extent of certain regulatory requirements based on the site specific conditions found there.

Consequently we support the current reevaluation and rewriting of regulations deemed to be overly stringent and unreasonably restrictive. It has been a pleasant opportunity to discuss and make recommendations in this respect with the OSM through the Interstate Mining Compact Commission.

We are also in support of reorganization efforts aimed at instituting a more equitable physical presence of the OSM from State to State and region to region.

The overall emphasis toward deregulation with the intent of providing realistic but effective regulatory guidelines for the surface mining industry should better allow the State to show our capability; that we can effectively implement and conduct a permanent program which regulates rather than penalizes the coal industry in Virginia.

In spite of the progress made to date in this respect, there are still some critical areas in the Federal law and regulations which need to be addressed. We strongly feel further and in some cases, extensive revisions need to be made, and I would like to comment on those areas that are considered of critical importance in Virginia.

As 95 percent of the surface minable reserves in Virginia are located on slopes in excess of 20°, the requirement for restoration of these areas to approximate original contour effects practically all the States' coal reserves. The enforcement of this provision deprives the Commonwealth of the right to dictate whether this land could be better used for other purposes.

The hydrology requirements as set down in the act attempt to address in a very broad based manner conditions which vary radically from geographic region to region. The hydrologic determination requirements for the mountainous terrain of Virginia cannot be the same as those for the flat lands of midwestern coalfields. Specific regional conditions must be taken into consideration.

The lands unsuitable for mining provision of the act constitutes an unfair taking of land under the fifth amendment and the usurpation of an individual landowner's right to profit from the commercial development of this property.

Numerous qualification criteria for eligibility under the small operator assistance program need to be reevaluated and services expanded to keep pace with economic conditions and better serve the small coal mine operator.

The elimination of duplicative project assessments and a seemingly punitive lien system are needed to enhance the implementation and operation of title IV abandoned mined land programs.

Also requiring revision are provisions limiting the use of AML funds; excluding land affected by mining processes after August 3, 1977, and those portions which fail to allow title IV programs to stand on their own merits.

These constitute some of the key portions of the act which we feel require revision or total elimination. They have been more fully addressed along with other provisions in the written comments we presented to this committee.

We would be happy to work with the OSM and other States negatively affected by these provisions in an effort to propose revised or new language for these areas of contention. Thank you.

I would also like to add that certainly as a Virginian, I have heard some comments this morning as a State and through the Compact Commission, there has been discussion of these revised regs, and you know, for several years, I think the State of Virginia and industry back since 1977 there at the beginning, we were beginning to feel like that we weren't capable of handling our own responsibilities. It seems like from what I have heard in the last few months, it seems like things are beginning to appear that Virginia has suggested many, many times and are beginning to surface, and appreciate that very much. Thank you.

[The prepared statement of Mr. Brown follows.]

FRED W. WALKER
Director
JERALD F. MOORE
Deputy Director

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DANNY R. BROWN, Commissioner

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SUBJECT: TESTIMONY OF DANNY R. BROWN BEFORE THE SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

DATE: September 2, 1981

Mr. Chairman, and members of the Committee, my name is Danny R. Brown. I am Commissioner of the Division of Mined Land Reclamation of the Virginia Department of Conservation and Economic Development. On behalf of the Commonwealth of Virginia, I would like to thank you for this opportunity to address the Energy and Mineral Resources Subcommittee on the Surface Mining Control and Reclamation Act of 1977.

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RECLAMATION MAKES IT RIGHT

Requirements dealing with groundwater data collection, topsoil removal, haulroads, lands unsuitable for mining, sedimentation ponds, disposal of excess spoil and backfilling and grading of previously mined areas were dealt with through the so called "state window" approach with the intent of providing alternative regulations which took the unique geologic and topographic conditions present in Southwest Virginia into consideration. All of these alternatives as well as other permanent program provisions were disapproved by former Interior Secretary Andrus in October of 1980 as being in conflict with certain provisions of the Act.

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Consequently we support the current re-evaluation and rewriting of regulations deemed to be overly stringent and unreasonably restrictive. It has been a pleasant opportunity to discuss and make recommendations in this respect with the OSM through the Interstate Mining Compact Commission.

We are also in support of reorganization efforts aimed at instituting a more equitable presence of the OSM from state to state and region to region.

The overall emphasis towards deregulation with the intent of providing realistic but effective regulatory guidelines for the surface mining industry should better allow the state to show our capability; that we can effectively implement and conduct a permanent program which regulates rather than penalizes the coal industry in Virginia.

In spite of the progress made to date in this respect, there are still some critical areas in the Federal law and regulations which need to be addressed. We strongly feel further, and in some cases, extensive revisions need to be made, all which will require changes in the Act. I would like to comment on those areas that are considered of critical importance in Virginia.

Title 30 U.S.C. Section 1265(d)(2): Approximate Original Contour

As ninety-five (95%) of the surface mineable reserves in Virginia are located on slopes in excess of 20 degrees, the requirement for restoration of these areas to approximate original contour effects practically all of the states coal reserves.

This requirement usurps the control the state should rightfully be able to exercise over industrial development in Southwest Virginia. It constitutes a deprivation of the state's right to allow alternate land uses.

There is a great need for level land in the coalfields of Virginia. Some of the uses by which strip mined land has previously been utilized, and which would be within the state's interest to continue, include construction of schools, airports, industries, recreation areas, and shopping centers on the leveled land. In addition to these uses, agricultural advantage was taken of strip mined land. In many instances, leveled land was sown with grain and grazed by cattle or sheep. The Federal law does not provide a variance for agricultural use on steep slopes.

In addition to preventing forward-looking land use planning, the reclamation provisions adversely affect land values. Before coal land in southwest Virginia is stripped, it is worth five dollars to seventy-five dollars an acre. After being leveled, land is worth a minimum of five thousand dollars an acre and may bring as much as three hundred thousand dollars an acre or one thousand to five thousand dollars a front foot. If land is restored to its original contour, its worth reverts to the lower values.

The facts also show that returning a steep slope area to original contour after it has been surface mined is not economically feasible. The cost of coal production is increased as much as seventy percent. On occasion the economic impracticality of strip mining coal is outweighed by physical realities; equipment may not be available to cover the highwall on a steep slope to restore the original contour. These effects aggregate to undermine the Commonwealth's economy: coal companies have gone out of business, between five hundred and one thousand coal miners have lost their jobs; income from surface mining permits has decreased; the coal-based revenues that the counties rely on to operate have been reduced. Most of the high schools built in recent years in these counties were financed through the coal severance tax. The production of coal is a two-billion dollar business in Virginia, contributing substantially to its economy.

Virginia has recommended that the Act should take into consideration the particular problems that existed in the coal industry due to terrain, as Congress had recognized was appropriate. The state is now in the position of enforcing an act so particularly unsuited to its terrain that compliance with its provisions has a higher potential for environmental harm than alternative procedures. A return to approximate original contour on a steep slope increases sedimentation because of the increased erosion from the unstable mass. In addition, a dangerous condition may be created by backfilling the bench. When overburden material is stacked up against the highwall, the normal process of settlement of the fill material tends to pull it away from the highwall. This provides a natural channel for water from the upper slope to flow down to the bench below and saturate the underlying material, creating an unstable mass with a likelihood of eventual collapse.

The approximate original contour requirement imposed by the Act is not environmentally sound. This provision and the postmining land use restrictions drastically affect the economy of the Commonwealth of Virginia, making it economically and physically impossible to mine coal, and prevent the state from using its land for agricultural purposes, for construction of airports, schools, hospitals, and for other activities.

Abandoned Mined Land Program

Virginia's Abandoned Mine Land Reclamation Program, administered by the DMLR, has achieved considerable reclamation success during the interim program phase of operation. One of the first nine (9) Priority I projects approved by the OSM was the St. Charles Project in Lee County, Virginia. Additional Priority I projects have been approved and the State AML Inventory has made progress in the evaluation and ranking of additional AML sites.

However, serious flaws in the Act and regulations exist which restrict procedures and grant program allotments, as well as create duplicative efforts. These are addressed by the section of law or regulation as follows:

PL 95-87, Section 401(c):

Monies in the fund may be used for the following purposes:

The absolute prohibition against any expenditure of funds to purchase structures or to move or strengthen them often prevents common sense, lower cost solutions to problems created by past mining practices. The lowest cost and most feasible solution to a problem as established by a sound engineering study should be allowed.

PL 95-87, Section 404, Regulation 874.12(2) Eligible Lands and Waters:

This section now excludes lands and waters affected by mining processes after August 3, 1977.

All abandoned or inadequately reclaimed sites that were mined between August 3, 1977 and May 3, 1978 should be included as there were really no Federal regulations in effect during that period of time.

All "so-called" two-acre exemptions that create an emergency or extreme danger situation should be included.

Any site which was affected by mining processes and later became an emergency or extreme danger should be included without regard to date of mining. This would include released permits, bond forfeitures, and sites not covered by the permit process such as tipples, docks, loading facilities, other structures, roads, etc.

PL 95-87, Section 405(a)(c), State Reclamation Programs:

Using the "carrot" of approval for the State Abandoned Mine Reclamation Program as an incentive for establishment of a Title V State regulatory program has seriously delayed implementation of the Abandoned Mine Land State Reclamation program because of built-in administrative and judicial delays to approval of the Title V Program. One third or more of the 15-year life of the Program will have elasped with no reclamation under State share funding accomplished unless this burdensome connection is broken.

Regulation 886.18(a)(3), Grant Reduction, Suspension and Termination:

If an agency fails to implement, enforce or maintain an approved Title V Program, the grants for the Title V Program can be terminated.

This burden should not be placed upon a Title IV AML Program. It would result in confusion, delays in planned or ongoing reclamation projects, and be a financial loss to the already limited AML Fund. The Title IV Program should stand on its own merits.

PL 95-87, Section 408, Liens:

The concept, incorporated within the law, that no windfall profits shall accrue to landowners from reclamation accomplished with funds accumulated under this Act has appeal as a protection against possible profiteering from a law designed to enhance the general welfare, but, in fact, it has erected a barrier which precludes landowner cooperation in a very significant percentage of reclamation projects.

Very little abandoned mine land in Virginia lends itself to alternative land use giving it a higher value after reclamation than it had prior to mining. The spectre of a possible lien of an unknown value to be placed against the surface owner of land having, in most cases, a negligible value monetarily is a great deterrent to the owner having a positive reaction when asked to sign an agreement allowing the land to be reclaimed under this law. Another significant factor is the financial status of the property owners. Aside from corporate ownership, the great majority of landowners live at or near poverty levels. Most individual owners received very little payment for their coal rights and have no financial resources to pay a lien. The spectre of the government placing a lien against their property which has already been ravaged by uncontrolled mining is frightening to them.

Corporate owners, while not generally suffering the lack of financial resources that plague the individual landowners, object to the lien provision for two reasons. First, they feel that this in effect double taxation since the money for reclamation comes from their production being taxed. Second, they are very strongly opposed to granting permission for work to be done which may result in a lien, which permission amounts to endorsement of a blank check.

Two methods of correcting this problem have been proposed. The most obvious is to delete the lien provision from the law. This would immediately remove all objections cited above and would save a very significant portion of the reclamation fund which is now being spent on repeated efforts to obtain landowner permission for reclamation to proceed, reduce the burden of repeated appraisals and the related legal costs that will assuredly follow as appraisals are contested, and increase the acreage of abandoned mine land that will be made available on a voluntary basis for reclamation.

The second method of alleviating this problem is to allow an appraisal to be made, prior to reclamation, which would determine the probable increase, if any, in value of the real estate parcel after reclamation had taken place. Based upon this valuation, a waiver of lien, as provided by the law, could be given the owner prior to reclamation in the great majority of cases where no significant increase would be expected. This approach leaves intact the restraints incorporated in the law and yet provides a reasonable vehicle to overcome landowner resistance to the blank check aspect of the present system. Police power entry would then be reserved only for those sites where a lien is a viable possibility or landowner resistance for other reasons is encountered.

The language of Section 408 of the law leaves little doubt that it was the intent of Congress to apply the lien potential to surface owners. It has been required by the Office of Surface Mining that the potential for a lien be applied to mineral owners who do not own the surface. This appears contradictory to the law and has further aggravated the process of obtaining rights of entry to mined sites since the State has been required to obtain mineral owners permission to enter upon surface areas where there is no effect on their subsurface mineral holdings. Removal of subsurface mineral owners from those consenting to surface entry rights would greatly facilitate the process of obtaining permission for entry to carry our surface reclamation projects.

Regulation 874.14, Reclamation Project Evaluation:

The requirement for environmental assessments for projects in AML is not found in the final rules, as such, but Section 874.14 entitled "Reclamation Project Evaluation" includes most of what is found in an environmental assessment. The Abandoned Mine Land Fund was created because of recognized adverse environmental effects of past coal mining practices. In the process we go through to select projects, the need for an assessment becomes satisfied.

To require an additional assessment is redundant and a waste of resources that could be better spent correcting AML environmental problems.

The purpose of AML projects is to correct already existing adverse conditions. In this respect the approach and outlook in AML projects is completely different from the usual Federal government actions requiring assessments or statements. Based on the "corrective category" of the projects, we request a deletion of the requirement to submit assessments for our AML projects.

In substitute (should deletion not be possible), we request that the State be allowed to develop a process whereby the environmental assessment becomes an expanded version of the project selection matrix. An assessment using this evaluation matrix expansion and consultations with other State agencies would satisfy Federal laws. It would prevent redundant work efforts and provide for increased cost-benefit efficiency in resources for "on the ground" reclamation.

The potential impact for each project needs to be assessed. Performing similar processes with different names for each project is not efficient or desirable. It increases costs and delays our mission of correcting problems created by past coal mining practices.

Small Operator Assistance Program

The Small Operator Assistance Program was created as a result of Section 507(c) of the Act (P.L. 95-87). The purpose of the program was to provide some assistance to the small coal surface mining operator in meeting the costly and complex requirements of Section 507(b)(11) and (b)(15) of the Act under a Permanent Regulatory Program. Virginia feels that there are many areas where changes and improvements can and should be made to insure that the Small Operator Assistance Program fulfills its intended purpose.

The Office of Surface Mining has made a few proposed changes allowing the states to adopt their own regulations to meet the Act and we wish to commend their efforts, however, there are many other changes needed to insure the continued preservation of the small coal mine operator in this country.

First and foremost, is the limitation the Act places on the production of a small coal mine operator of 100,000 tons. We feel this limitation should be increased. The current economic conditions associated with mining industry in this country have reached or soon will reach a point where the current limitations imposed on the small mine operator will be inadequate for an operator to remain in the mining business. We have been told by many people that production cost, engineering fees associated with permitting, reclamation costs, and bond rates have escalated rapidly in the past five years and will continue to rise.

The second area of concern is the requirement in the Act which limits the scope of work which governs the Program. The Act states the Small Operator Assistance Program may only assist the operator in two areas, namely "the determination of the probable hydrologic consequences" and the "statement of the results of test borings or core sampling", under Sections 507(b)(11) and 507(b)(15) respectively. These two areas of the Act compose the heart of the permit application requirements. All environmental studies remaining and planning requirements with very few exceptions closely relate to these studies and are necessary for an adequate permit application.

We would like to request that the Small Operator Assistance Program's services be expanded at a minimum to include all permit application requirements directly related to hydrologic and geologic investigations and planning, including operations and reclamation planning.

30 U.S.C. Section 1272: Designating Lands Unsuitable for Surface Coal Mining:

This provision of the Act constitutes an unfair taking of land without just compensation to the landowner under the Fifth Amendment, and restricts his right to profit from the development of his property.

The standards of performance in place in the Act provide controls designed to ensure that mining and reclamation operations are conducted in a manner that maintains environmental quality. The review of the operators' permit application and subsequent approval or disapproval by the regulatory authority should be adequate to determine suitability for mining.

Under 30 U.S.C., Section 522(c), anyone with alleged interests which may be adversely affected by a proposed operation may petition the regulatory authority. Although such petitions must contain supporting evidence of adverse affects, the petition process, no matter what its outcome, represents an extreme burden upon the applicant for a permit in time and profits lost pending settlement of the petition.

It will also place a financial burden on the regulatory authority who must publish notice, conduct hearings and expend an unpredictable number of hours and dollars in the review of these petitions to determine their validity. In addition, this will infringe upon the review time needed for other permits.

More importantly, this provision in the law is unacceptable since it potentially denies landowners the right to use the land even in an environmentally sound manner should a petitioner successfully prove the land could better serve anticipated future generations if used differently.

Hydrology

The Commonwealth of Virginia recognizes the need to protect the surface and underground water resources of its coal mining region. Those requirements related to the prevention of toxic contamination of water resources by mine wastes and the control of mine related run-off and sedimentation are viewed as important considerations in the steep terrain of the Virginia coalfields.

However, certain requirements designed to monitor hydrologic balance or to make hydrologic determinations have been written without taking into consideration the variations in hydrologic conditions found in different geographic regions. In this respect we find the requirements for arid and semi-arid regions of the nation are being applied in Virginia, which receives substantially more rainfall.

Monitoring wells designed to determine major aquifers which constitute important flat land water supplies in the west should not be required in the unpredictable geologic faulting found in Virginia. The science of groundwater hydrology in this region is an inexact one at best.

The protection of existing watersheds, tributaries and their receiving streams are viewed as a priority concern. However, in an area such as the coalfields of Virginia where the annual rainfall is forty-five (45) to fifty (50) inches per year, where steep slope and ridgy terrain negate any continuous or major source aquifers and where groundwater resources are only moderately used we feel that the economics of identifying these aquifers to the extent required by P.L. 95-87 are not offset by the environmental concerns.

Elements of concern in the western regions such as recharge capacity, lateral extent and the probable hydrologic consequent are not as important to environmental protection in the east as is the premining determination of potential effects to the area, and the use of overburden handling and treatment techniques designed to minimize any detrimental environmental effects.

In addition, there are numerous areas in P.L. 95-87 that overlap requirements in EPA, particularly NPDES and consequently have a serious impact on the coal industry. Therefore, some of the problems with P.L. 95-87 are inherited from problems in the Clean Water Act. We believe consideration must be given for exemptions in meeting effluent requirements where existing discharge violate standards even without disturbance. We contend that the operator should only be required to maintain existing water quality, and upgrade water quality only where practical and technologically and economically feasible.

Senator WARNER. Thank you, Mr. Brown.

The luncheon for those who desire to purchase is available in the Buchanan Hall here on the campus, and we are going to convene promptly at 1, and we are going to hear next from a panel representing environmental considerations, that is panel B, and I ask that they be prepared to start promptly at 1.

We will have a press conference here. Anyone who desires to attend may do so.

We thank the members of this panel. We are sorry that West Virginia and Tennessee didn't appear this morning. We invited them, but for reasons best known to them, they didn't appear.

Mr. WAMPLER. Just one brief word. I want to thank each of the witnesses for their testimony. Of course, I have had the opportunity to know Mr. Brown in a very personal way since we work on many of the problems that you have discussed here this morning. Since State primacy is to become a fact of life, I want to admonish each one of you and your counterparts to do your best for the State in a fair but firm manner, because unless you do, it is going to mean that some people in the Congress elsewhere are going to say, "We were right, we told you that the States were incapable of fulfilling their responsibilities."

Now if you are firm and fair, you are on occasion going to incur the wrath of industry. You are going to incur the wrath of the environmentalists. But I have confidence that you will do this in a fair and responsible way. I hope that you and your associates and counterparts will keep that uppermost in your mind, because it is terribly important that those of us who believe in States rights, we want the States responsible and we expect you to carry it out.

Senator WARNER. The press conference will begin as soon as we adjourn.

[Whereupon, a recess was taken at 12:25 p.m. to reconvene at 1 p.m.]

AFTERNOON SESSION

Senator WARNER. The subcommittee will now resume and we have panel B. I understand there has been a substitution and Ms. Cathy Stanley of the Council of the Southern Mountains will appear.

We have also Maureen O'Connell, Save Our Cumberland Mountains; Thomas FitzGerald, Research Defense Fund. Is he present?

Mr. FITZGERALD. That is Appalachian Research and Defense Fund of Kentucky, Inc.

Senator WARNER. Thank you.

Ms. Jenny Freeman, Tennessee Citizens for Wilderness Planning, Knoxville, Tenn. Thank you.

Why don't you have Ms. Stanley be the leadoff witness. Thank you very much.

Ma'am, if I might suggest, pull that microphone up.

STATEMENT OF CATHY STANLEY, COUNCIL OF THE SOUTHERN MOUNTAINS

Ms. STANLEY. I would like to express my appreciation of the Office of Surface Mining. The office has been given a massive task in the writing of surface mine regulations for a broad piece of legislation.

It has also undertaken the enforcement of these regulations while sorting through primacy proposals and law suits, and has been doing an admirable job, despite some of the usual learning and growing pains of any new Federal agency. It has been as flexible as possible without compromising important environmental standards and should be strengthened, not weakened, so that it can continue in and improve its enforcement of the 1977 act.

It is necessary for strong enforcement to accompany sound standards. In order to insure this, inspections and standards must be maintained and improved. Citizen participation must be made readily available on the State level. The problems of abandoning active sites must be addressed, monitoring must be improved, and civil penalties must be enforced even more rigorously, when violations are not corrected according to schedule. Otherwise, operators will be encouraged to again flaunt the regulations which are "on the books."

The 1977 act began to hold mine owners accountable to the Federal Government, setting minimum standards for reclamation, and enabling enforcement of these standards across the board through the Office of Surface Mining. The act also gave residents in areas affected by strip mining a chance to call for and accompany inspections of mines believed to be violating regulations and threatening their land and water, and to make demands upon the State, should it fail to enforce the law and protect the environment.

Over the past 4 years of the act's existence, many instances of irresponsible mining have been pinpointed and violations have been brought to a halt, preserving acres of land which would otherwise have been damaged beyond reparation. Citizens have been responsible for holding both mine owners and OSM to these regulations, adding considerably to the act's clout.

If these channels are bypassed in any way, we will be sliding back into the pre-Federal days when States were encouraged by the industry to compete for the lowest environmental standards. We have gone beyond the times when the cost of coal is merely that of getting it out of the ground. We have to take into account the costs of reclaiming the land and protecting land and water resources from permanent destruction. The Office of Surface Mining, with its combination of primacy programs to give States their own programs, and its firm Federal standards to prevent detrimental mining practices, is an important link in the protection of resources vital to the people of Appalachia and our future.

We of the Council of the Southern Mountains therefore recommend that the Office of Surface Mining be strengthened and supported in order that it continue to aid in the sensible mining of our coal and the protection of our land and communities.

Thank you.

Senator **Warner**. Thank you very much.

Ms. O'Connell, if you would be next, please.

STATEMENT OF MAUREEN O'CONNELL, SAVE OUR CUMBERLAND MOUNTAINS

Ms. **O'Connell**. Senator Warner and other members of the Senate Energy and Mineral Resources Subcommittee, my name is Maureen O'Connell and I am a member and staff worker for a coalfield citizens organization in Tennessee, Save Our Cumberland Mountains, also called SOCM. The majority of the 600 families who are members of SOCM are residents of Tennessee's 15 coal-producing counties and are or have been directly affected by strip mining in their communities.

SOCM will be celebrating its 10th birthday this year. It has had almost as long a history with the development and implementation of the Federal act under discussion today. It was in 1972 that SOCM members first lobbied for Federal protection from strip mine abuses—then it was a bill to ban strip mining from the coalfields and encourage a safe, healthy underground industry. This bill, introduced by former Representative Ken Hechler of West Virginia, had 60 to 70 sponsors back in 1972.

In succeeding years it was a series of regulatory bills that were debated in Congress. SOCM members, along with citizens from all over this country—from the ranches of Montana and the reservations of New Mexico to the farms of Illinois and the steep slopes of southwestern Virginia—came nearly every year to work for a law that would protect their homes and wells from blasting, their aquifers from draining, their fields and property from flooding, their land from being mined without their consent, and their steep slopes from sliding into silt-choked creeks.

We have watched the present Federal law evolve. We have seen a stronger early version of the bill weakened. We have seen the bill compromised in certain sections because sponsors were trying to avoid a Presidential veto by Nixon and Ford, only to see the bill vetoed anyway. We, like many citizen groups especially in the mountains, lobbied for limits on steep slope mining, mountaintop removal, and against other of the more destructive strip-mining practices; we failed in these efforts. We urged President Carter to veto this act because we felt that a stronger bill could be passed when the threat of a Presidential veto was no longer present.

Now there are those who are clamoring for the act to be reopened and weakened. Senator Warner, this bill is already very much a compromise bill, and has not even had a chance to be fully implemented. We urge you not to allow the act to be reopened and further weakened.

THE NEED FOR A STRONG FEDERAL ROLE IN IMPLEMENTING THE ACT

When the effort to enact Federal legislation began in the early 1970's, there was great need for Federal intervention. Massive personal property damage was resulting from unregulated or poorly regulated mining practices. Private citizens and taxpayers were forced to pay the real costs of strip mining. In the States that did have laws, State legislatures and enforcement agencies were so dominated by the coal industry that the inadequate laws they had were not being enforced.

We want to show today that the need that resulted in the Federal Government's taking a role in strip mine regulation is still very much present. Personal property damage is still occurring and the enforcement record of at least some States is barely improved.

ENFORCEMENT RECORD OF THE STATE OF TENNESSEE

We would like to present as part of this testimony "A Study of Tennessee Strip Mine Enforcement," a study that SOCM recently released. (Statistics are as of November 1980.) This study, based on an investigation of over 230 files in the State division of surface mining (DSM) office revealed the following:

Inspection procedures

1. For the worst offenders—those operators who eventually received a notice of bond forfeiture—an average of about 11 months (337 days) elapsed between the first notice of noncompliance (NNC) and the notice of bond forfeiture. During this time land remained unreclaimed. ("Study," p. 6)

2. At least 26 unreclaimed sites on which NNC's had been issued never received a notice of bond forfeiture. These sites averaged 3½ years in their unreclaimed state. ("Study," p. 8)

3. A chart comparing the number of enforcement actions with the number of permitted operations in each county reveals wide discrepancy between counties. A further chart comparing the number of enforcement actions with the length of service of each State inspector indicates reasons for this difference. While several inspectors averaged one or more enforcement actions a month, one State inspector showed a total of 3 actions in 79 months of employment. ("Study," p. 14, 16) The researchers found no systematic training for inspectors and no system for performance evaluation.

4. In several case studies researchers found evidence of lack of administrative support for requested enforcement actions and of political interference in the enforcement process. ("Study," p. 20–22)

Bond forfeiture

1. Although 108 notices of bond forfeiture have been issued since 1972, at least 88 of those sites remained unreclaimed at the time of the study. ("Study," p. 26.)

2. Although the law clearly calls for a bond set to cover the cost of reclamation, bonds are still routinely set at the minimum under the law ($1,000 an acre during the period under the study, now $1,500 an acre—still very inadequate). ("Study," p. 28.)

3. Out of the total 25 bonds collected by the State only 5 sites have ever been reclaimed by the State. ("Study," p. 31.)

Board of reclamation review

At the time of the study the Board of Reclamation Review was a five member administrative board which hears appeals of DSM actions. Recently the Board was increased to seven members. Two of the members are representatives of the coal industry. Both of the present industry board members have been served violation notices on their operations. We contend that having coal representatives on such a board constitutes a conflict of interest.

Wildcatting (the mining of coal without a permit)

1. Several cases are documented where State inspectors failed to issue a cease order to wildcatters even when they found them on the site. ("Study," p. 40–41.)

2. In a comparison of Federal OSM and State DSM inspection records between June 1978 through October 1979, researchers found that OSM issued cease orders to 63 wildcat operations. DSM failed to issue cease orders on 48—or 76 percent—of these same sites. ("Study," p. 10.)

3. In the 12 years of DSM's existence wildcatters have only been fined five times. ("Study," p. 42.)

Just a word further about the problem of wildcatting. In the last couple of months with the aid of the Tennessee Bureau of Investigation (TBI) the State has conducted a couple of successful raids on wildcatting operations. We have commended them on these actions and hope for many more. However, wildcatting is not a phenomenon of small dimensions in Tennessee. In 1980 the State DSM director estimated that at least 10 percent of all the acreage being mined in Tennessee was being wildcatted. And when you consider how many of these operations are by necessity fairly small, some idea of the large number of individuals we're talking about becomes apparent. A couple of aerial observations undertaken by OSM in late 1979 also reveal the dimensions of this problem:

First. On September 11, flying over parts of Campbell, Scott, and Anderson counties, 45 mines were observed; 55 percent of these were wildcat.

Second. On November 15, flying over other parts of these counties, 31 sites were observed; 75 percent were wildcat.

And although again we applaud the two recent efforts by the TBI and DSM, it remains true that in areas like Stinking Creek in Campbell County (probably the most notorious wildcatter area in Tennessee) it was not until OSM with Federal marshalls began a crackdown in that area that any enforcement action was taken at all. Stinking Creek is the site where infamous wildcatter Robert Hatmaker has assaulted both a State inspector and a Federal inspector, threatened a MESA helicopter with a bulldozer and openly dared any enforcement official on his land. It was OSM that took Robert Hatmaker on, resulting in his being shut down, receiving a fine, and 6 months in the half-way house.

Why present all this documentation on the State of Tennessee's enforcement record? Only to show our continued concern that responsibility for carrying out the Federal law not be blindly handed over to the States.

Tennessee's first submittal of a State program was very incomplete and inadequate. The State had not promulgated regulations, had not prepared sections on lands unsuitable or citizen participation, and had submitted incomplete systems and narrative sections.

The intent of the Federal act is clear. Only when States have demonstrated that they are capable of carrying out the full mandate of the law should they be given this responsibility. We feel that the State of Tennessee has a long way yet to go to prove that capability. What we fear is that with the current administration in Washington's apparent desire to put responsibility in the State's hands as quickly as possible, there will be increasing pressure to accept whatever program the States submit, regardless of the merit of an individual program.

OSM'S ROLE DURING THE INTERIM PROGRAM

Against a back-drop of State enforcement efforts such as described above, it is easy to see why OSM has been accused by many as being overzealous. "Overzealous" in this context can mean simply enforcing the law, and writing violations when they are found (as is mandated by this act).

Citizens in the coalfields with whom SOCM works have come to refer almost all citizen complaints about wildcatting and other violations to OSM rather than the State. Our experience has been that OSM inspectors will treat these complaints seriously, will report back to citizens about actions taken, and will not treat citizens as nuisances to their work as some State inspectors blatently do.

RECENT OSM ACTIONS: REORGANIZATION PLAN AND REGULATION CHANGES

It is also against this backdrop that our alarm arises over changes being announced by the new OSM administration in Washington. There is a lot of talk about eliminating regulations that are cumbersome and burdensome to industry; there is not, however, much talk about what sacrifice of public protection and what environmental degradation might occur as a result of eliminating these.

There is a plan that's been announced to reorganize OSM in the field—to abolish regional and most field offices and replace these with a small staff in State offices. What we see happening with this plan is an increasing morale problem within OSM as personnel face massive moves for little reason, increasing cost to the Government, and less accessibility to the States and OSM in the field of vital technical services.

There is not time here nor perhaps is this the forum to comment on individual proposed regulation changes. These proposals range from the new broad wording of the "State window" which is now a barn door opening the way for almost infinite variations from State to State of how the standards of the act are to be achieved, to the removal of almost all "design criteria" from the regulations, leaving it back up to the operators to decide how on an individual site operations are to be carried out. (That's how it was before there was a law.)

What we do ask of you and your committee, Senator Warner, is that you carefully scrutinize these proposed regulations to make sure that they are not subverting the legislative intent of the act, and failing to carry out the mandate of Congress to protect the public and minimize the damage to our land and streams.

In conclusion, we do appreciate the chance to appear before this subcommittee and present the views of coalfield citizens who are members of SOCM. We as an organization have long been involved with the development and implementation of this act. Our members bear the direct consequence of how well it is working. Three weeks ago one of our members' homes had rocks thrown on the roof by a blast from a wildcatter's operation; another member was almost hit by rocks while hanging out laundry in her backyard by the same operation.

Citizens continue to be intimidated from exercising their rights under the law. Within the last 2 years 3 homes of SOCM members have been burned—all directly related to some effort to exercise their rights to testify at legislative hearings, protest a permit, or report wildcatters. Late night phone-calls are routine in some areas.

Now is no time to begin to pull back from as effective a Federal presence in the coalfields as possible. We ask you again not to allow the act to be reopened and weakened. Rather see if there are ways through the coming budget conference to make sure there is sufficient money for an effective Federal inspection force. And watch carefully to see that proposed regulation changes and costly reorganization plans do not subvert the purposes of the act.

[The study submitted by Ms. O'Connell follows:]

A STUDY OF TENNESSEE STRIP MINE ENFORCEMENT

Save Our Cumberland Mountains

1981

The general assembly finds that the unregulated surface mining of minerals can cause soil erosion and landslides, stream pollution, and accumulation and seepage of contaminated water; contributes to floods; impairs the value of the land for agricultural or other purposes; affects fish and wildlife and their habitats; counteracts efforts for the conservation of soil, water and other natural resources; impairs the owners' rights in neighboring property; creates fire hazards; and in general creates conditions inimical to life, property and the public welfare so as to require the exercise of the state's police power in the regulation of surface mining. TENNESSEE COAL SURFACE MINING LAW

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INTRODUCTION

According to 1980 Department of Labor statistics, coal mined by stripping represents over half the total coal production in Tennessee. Tennessee coalfield citizens are personally affected by the increased use of this mining method. The quality and effectiveness of enforcement of the Tennessee Surface Mining law afforded by Tennessee's Division of Surface Mining (DSM) directly affects the personal safety and property of citizens living in coalfield areas. This study of the Division's enforcement record grows out of the continued concern of coalfield citizens who are members of SAVE OUR CUMBERLAND MOUNTAINS.

Two previous studies, "A Study of Tennessee Strip Mine Enforcement," 1970-1977, by SAVE OUR CUMBERLAND MOUNTAINS and EAST TENNESSEE RESEARCH CORPORATION, and, "An Assessment of State Surface Mining Enforcement Procedures in Tennessee," by the U.S. Office of Surface Mining, 1979, examined the State's record and offered conclusions and recommendations. This study examines and updates information through 1980.

The intention of those researching and writing this study is to increase public awareness of the difficult position of the coalfield residents and to contribute to a renewed effort to improve the efficiency and effectiveness of the Division's enforcement of the state's strip mine law.

METHODS OF ANALYSIS

Staff and members of Save Our Cumberland Mountains (SOCM) used Division of Surface Mining (DSM) records as the primary source of information in their research. The companies investigated were selected from a list received from the Division Staff Attorney titled, Letters of Non-Compliance and Bond Forfeiture. This is a list of all companies cited for violations by the state since 1972. Because the intention of the study was to examine the effectiveness of DSM's enforcement actions, researchers studied those companies receiving notice of bond forfeiture and more than 100 other companies cited for violations. Actions requested, actions taken, dates, and memo comments were all recorded by researchers. Altogether, 230 operations were studied.

Inspection reports from the United States Office of Surface Mining (OSM) were also used. Information of Bond Forfeiture and cases appealed to the Board of Reclamation Review came from records in the State's Attorney General's office. Staff also received information from informal interviews with state inspectors.

The data collection began in April 1980 and was completed by November 1980.

ENFORCEMENT ACTIONS AVAILABLE UNDER THE LAW

The 1980 session of the Tennessee Legislature passed a new surface mining law (codified at Tennessee Code Annotated § 59-8-301 et seq.) in an effort to meet the requirements of the Federal Surface Mining Act of 1977 (codified at 20 U.S.C. § 1201 et seq.). The Tennessee Act went into effect May 4, 1980, upon signing by Governor Lamar Alexander. The new Tennessee law changed somewhat the enforcement tools and procedures DSM must follow.

When an inspection is made, the inspector prepares a report on a standard form which is reviewed by his area supervisor and placed in the permit files in Knoxville and Nashville. Some inspectors merely discuss problems verbally with the operator and do not write it in the inspection report or issue a citation.

When a violation is noted in an inspection report, the inspector may or may not give the operator deadlines for correction. The inspector may choose at any time to issue an official citation, called a Notice of Non-Compliance (NNC).

Prior to an administration decision made in early 1980, inspectors were required to get requests for citations approved by the area supervisor and the office director before issuance. That policy has been changed to allow immediate issuance of notices of non-compliance by the inspector.

The first notice of non-compliance may be followed by a second notice of non-compliance if the violations are not satisfactorily corrected.

The inspector may at any time issue a cease order to require the cessation of mining until violations are corrected. Cease orders are usually given for mining outside a permitted area or without a permit.

Once a cease order is issued, the next step in the sequence of official action is either a permit suspension or a permit revocation, both of which must be approved by the DSM attorney after review by the Commissioner of Conservation and office directors. If the operator's permit has not expired, DSM may suspend it until the violations have been corrected. If the violation is not corrected DSM may issue an Order of Bond Forfeiture.

In almost every case reviewed, the operator's permit for mining had expired by the time the enforcement process reached the bond forfeiture stage. In such cases a permit suspension was not possible. So, DSM issued a Notice of Revocation and Order of Forfeiture which revokes the permit and forfeits the bond simultaneously.

After receiving the Notice of Forfeiture, the operator has ten days within which to appeal the decision to the Board of Reclamation Review. If the company appeals, the Board sets a hearing date at which DSM and the company argue their cases. The Board's decisions may be appealed within the court system, although this is rare.

If the operator chooses not to appeal the revocation and forfeiture, DSM may immediately begin the process of collecting the forfeited bond. To obtain a permit, operators must post either a cash bond or a surety bond. If a cash bond is being forfeited then the total amount of money is already in the State's keeping and is available for immediate use.

Most commonly, the operator has secured a bond through a bonding company, in which case DSM must notify that company of the impending forfeiture. The company may either forfeit the bond and pay DSM or they may keep the bond money and contract out for reclamation directly.

If the bonding company achieves satisfactory reclamation, then DSM releases their bond money. If such reclamation is inadequate, or if the bonding company has refused to reclaim, the bonding company must pay DSM. DSM is then responsible for collecting bids for the particular site and contracting someone to do the reclamation work.

INSPECTION PROCEDURES

Researchers checked a file of 230 cases to investigate the following facts relating to inspection procedures followed by DSM:

-- The time intervals occurring between observation of a violation and action;

-- Procedural guidelines and record keeping systems aiding inspectors in their work;

-- Inspector training, standards of performance, and evaluations;

-- DSM administrative support for inspectors and technical staff in the field; and,

-- Impact of political pressures on inspectors and administrators.

Inspector Performance

Time Interval Between Observation of Violation and Action.

The OSM study, "An Assessment of State Surface Mining and Enforcement Procedures in Tennessee," completed in 1979, offered statistics on the time intervals between each action taken by the state against companies in violation. The data showed that, "time intervals over which non-compliance extends is extremely lengthy and significant (and possibly irreversible) damage is occurring."

The researchers for the present study found an average of 11 months, (337 days) between issuance of the first Notice of Non-Compliance and the issuance of a Notice of Bond Forfeiture. Eleven months represents enough time for serious environmental damage to occur. One example of this is:

> Josie, Inc., (#75-90), Marion County
>
> The area was mined in 1975. In September 1977 an inspector warned James Nunley, the owner and operator, that an NNC would be issued if reclamation was not completed.

> In March 1978 the inspector requested an NNC which was issued in June. In August, a second NNC was issued. By November, the inspector requested a Bond Forfeiture Notice be sent.
>
> In April 1979 the Bond Forfeiture Notice was finally issued.

The seven months between September 1977 when the inspector warned Nunley and March 1978 when an NNC was finally issued represents an unofficial negotiation period between the operator and the inspector. These negotiations occur frequently and are outside the official mechanism of enforcement.

"Firm deadlines are also negotiable. Continuing with the Josie case:

> Following the issuance of the Bond Forfeiture Notice, James Nunley was given a firm deadline of November 1, 1979, to correct the violations that led to bond forfeiture.
>
> One year after the issuance of the Notice an inspector's report dated March 1980 states, "Bond Forfeiture will be requested if the area is not brought into compliance by April 30, 1980."

The following description of DSM's enforcement efforts with Richten Development Corporation is a further illustration of the lengthy time intervals between observation of a violation and enforcement action.

> Richten Development Corporation, (#78-221), Sequatchie County
>
> In March 1979, the Richten company showed major violations, and the state inspector requested an NNC and required no more mining be done until compliance was reached.

Three months later the inspector noted that the operator continued to mine, made no attempt to reclaim, pushed considerable spoil over the outslope, disposed of topsoil, and left toxic materials uncovered. Furthermore, he noted that the company's intention to deep mine was probably unfeasible because the seam was only 12" - 14" thick. Finally, he noted that he had requested legal action "many times" and that none was forthcoming.

On June 28, the permit was suspended.

At a meeting with company officials on July 11, the Department of Surface Mining (DSM) told Richten that it had to reclaim by July 19 and that no extension would be granted unless a reasonable amount of work was done.

No work was even begun until October, and then, very little was accomplished.

By November, the inspector reported spoil within five feet of the stream, discharge from silt basins, dam walls sloughing and no attempt made at spoil recovery.

On January 1980, Richten began some work again on spoil recovery work. Work was hampered by winter weather until April when Richten wrote C. C. McCall, then Director of DSM, saying he needed two months to complete the work of reclamation and requesting a new permit to begin a deep mine there.

In a letter written April 14, 1980, C. C. McCall said to Arthur Hope, Assistant DSM Director in Knoxville, that he had ". . . received a letter from the president of Richten Development Corporation agreeing to complete the work needed on the Sequatchie County site within two months, weather permitting, after issuance of the permit. Continue to speedily process permit application if you have it."

The permit was renewed. The site remains unreclaimed.

Twenty-six unreclaimed sites with NNCs have never been served a Notice of Bond Forfeiture. These sites average three and a half years in their unreclaimed state. Some have not been inspected for as long as two years. The following offers a case in point:

Van Buren Mining Company, (#76-52), Van Buren County

After numerous and repeated inspector requests for Notice of Non-Compliance and Bond Forfeiture, a Notice of Non-Compliance was finally issued on August 27, 1976, to the Van Buren Mining Company.

During 1977 the area remained in non-compliance.

By May 1978, the insurance company which had bonded the company had done some reclamation work.

In 1979, it was evident to inspectors that the reclamation was inadequate.

Over three years after the date of the first NNC, in January 1980, the state inspector reported that only a 30% vegetative cover remained and requested that either the work be done or the bond be forfeited.

The last entry in the file showed that negotiations with the insurance agency were ongoing.

A Comparison of Enforcement Actions Taken By Federal OSM Inspectors and State DSM Inspectors On the Same Mining Operations

Enforcement actions by the State Division of Surface Mining (DSM) and the Federal Office of Surface Mining (OSM) inspectors evaluating the same operation vary widely. OSM and DSM records of enforcement actions were compared for the period of June 1978 through October 1979. Both agencies are required by law to conduct regular inspections of all permitted operations. During this time period, OSM issued Notices of Violations and/or Cease Orders to 173 operations. Of these, 110 operations were permitted and 63 were "wildcat" operations (without permits). A review of DSM enforcement actions on these operations yielded the following statistics:

1. Of the 110 permitted operations that were issued OSM Notices of Violation (comparable to the Notice of Non-Compliance issued by DSM) and/or Cease Orders by OSM, 71 of these (or, 64%) had not been issued either a Notice of Non-Compliance or a Cease Order by DSM.

2. Of these 110 permitted operations, 20 operations were issued Cease Orders by OSM. None of these 20 operations received an enforcement action of any kind by DSM.

3. Of the 63 wildcat operations receiving Cease Orders from OSM, 48 (or, 76%), did not receive a Cease Order from the DSM.

A closer inspection of the permitted sites involved in these statistics shows that all but two of the cases in which the NOVs were issued by OSM were for serious infractions of the environmental performance standards, as well as failure to post signs, markers, etc. A few examples follow:

> DuPont Smith Enterprises, (#79-12), Campbell County
>
> Federal inspectors cited DuPont Smith starting in November 1978 for violations involving haulroad debris in the stream, no sediment control, mining within 100 feet of a perennial stream, mixing spoil with the topsoil, and stockpiling coal off the permit area.
>
> The state inspectors visited the sites four times between May 1979 and September 1979. During those months the inspection reports noted that the vegetation had not taken and remulching and reseeding were necessary. These problems continue to be named up to September 28, 1979. No NNC is issued by the inspectors involved. Instead, on November 7, 1979, the $59,000 bond is reduced to $1,000.

Shemco, (#79-109), Morgan County

From July 1979 to September 1979 the federal inspectors gave Shemco NOVs for lack of sediment control, failure to salvage topsoil, slides and spoil on the downslope, failure to meet effluent limitations, improperly constructed diversion ditches and silt basins.

Beginning in June through December of 1979, DSM inspectors submitted ten reports on this mine site. Their reports noted the following: heavy rains causing slumping of outslope of haulroad; drainage ditch needed cleaning due to two small slides; permit markers not clear; "highwall needs to be eliminated as mining progresses;" slides in three places; problems with the silt fence; silt problem, gullies formed in heavy rain; a gully on the outslope of the dam; insufficient topsoil being saved; problems of excess sediment in the ponds.

Not a single NNC was issued for all these problems named in reports over a period of six months.

Royal Gem, (#78-234), Claiborne County

(The owner of this operation, Carl Rice, is on the Tennessee Board of Reclamation Review which hears appeals of Division administrative actions.) From November 1, 1978 to October 1979, federal inspectors issued NOVs for inadequate blasting records, failure to meet effluent standards, lack of sediment control, failure to remove and stockpile topsoil. No DSM enforcement actions were taken on this site.

Inspector Training, Performance Standards, and Evaluation

Interviews with DSM personnel indicate there continues to be no formal training for inspectors despite requests by inspectors for such training. A new inspector simply follows a trained inspector into the field and begins work. Likewise, performance standards have not been developed and a formal evaluation of inspector performance has not been established.

An absence of performance standards is also evident and results in cases like the following:

Mullis and Haynes, (#78-174), Campbell County

In January 1979, nearby residents petitioned DSM about heavy blasting by M. Mullis and Haynes. One month later, the inspector, Joe Clawson, responded to the complaint accusing petitioners of being "anti-surface mining" to the point of making false accusations to stop surface mining. Clawson stated he had worked closely with the operators and found them to stay closely to the rules and regulations.

Two days following Clawson's inspection, another DSM inspector examined the company's blasting log. The inspector found M. Mullis and Haynes in violation five separate times in January for detonating excessive amounts of explosives and causing flyrock to leave the mine site.

The following case implies even supervisory staff operate without performance standards:

Dean Coal Company, (#79-204), Campbell County

Although OSM issued several NOVs in December 1979, and a Cease Order in March 1980, DSM had not noted any violations on Dean Coal. OSM violations included failure to control drainage, build proper drainage controls, and failure to segregate topsoil.

In April 1980, the State Water Quality Control Division which in Tennessee must issue a water quality permit before a strip mine permit is issued, notified DSM that Dean Coal Company's plan had never been submitted and approved.

In a letter to DSM area supervisor, Larry Stephens, Water Quality staff stated, "allowing Dean Coal Company to mine approximately 10 acres prior to the submission and approval of engineering plans by this Division has violated the conditions set forth by the DSM Pre-Mine Report and the state certified NPDES."

Stephens later admitted in a letter to Assistant Director, Arthur Hope, that he was aware of the violations OSM had noted earlier. He states, however, that " . . . Mining was completed in early summer; the area is regraded and ready for immediate seeding. It seems the issue is now moot."

(Dean Coal Company is owned by Dr. Ralph Ross, one of the five members of the Tennessee Board of Reclamation Review.)

The following chart developed from information obtained in DSM reports, compares work done by different inspectors. It gives the number of enforcement actions carried out by each inspector throughout his months or years of service. With the exception of one inspector (B. Smith) the inspectors have worked in the counties indicated from the beginning of their employment.

State Inspectors	Number of Enforcement Actions	# of Months Employed Up to April 1980	# of Enforcement Actions Per Month	County Areas of Work
BAKER	31	22	1.4	Bledsoe, Putnam, Ray, Cumberland, White
BROOKS	73	47	1.5	Morgan, Fentress, Overton
CLAWSON	3	79	.03	Claiborne and Campbell
DISTEFANO	47	23	2.04	Campbell
JOHNSON	35	19	1.84	Anderson and Morgan
LANGLEY	9	12	.75	Morgan
REYNOLDS	1	20	.05	West Campbell and NE Scott
RAGON	65	20	3.25	Hamilton and Marion
SISSOM	66	61	1.08	Van Buren, West Sequatchie, West Bledsoe
SMITH	0	22	0	Campbell (1), Hamilton, Sequatchie (1)
SWART	107	19	5.63	
TAYLOR	48	114	.42	Scott

Larry Stephens was supervisor of all inspectors until summer of 1979 when the northern and southern counties were split and Swartz was appointed as area supervisor of the southern counties.

The following chart also based on statistics compiled from DSM records shows enforcement patterns in each county. The normal performance variations among companies do not account for the wide variations in enforcement actions.

COUNTY	TOTAL NUMBER OF PERMITS ('73-'80)	TOTAL NUMBER OF PERMITTED OPERATIONS RECEIVING NOTICES OF NON-COMPLIANCE		TOTAL NUMBER OF PERMITTED OPERATIONS RECEIVING FORFEITURE NOTICES	
*SCOTT	351	39	11%	6	1.7%
*CAMPBELL	347	36	10%	5	1.4%
*ANDERSON	133	3	2%	1	
*MORGAN	119	33	27%	3	2.5%
*CLAIBORNE	83	2	2%	1	1.2%
FENTRESS	115	34	29%	10	8.6%
BLEDSOE	73	40	54%	19	26%
GRUNDY	56	28	50%	10	17%
MARION	54	20	37%	9	16%
CUMBERLAND	49	15	30%	9	18%
SEQUATCHIE	46	14	30%	6	13%
VAN BUREN	30	8	26%	4	13%
HAMILTON	15	10	66%	4	26%
WHITE	12	6	50%	6	50%
OVERTON	9	7	77%		0
PICKETT	2	1	50%	1	50%
RHEA	1	1	100%	1	100%
PUTNAM	2	2	100%	1	50%

*Top five coal producing counties.

This chart shows the counties with the lowest percentage of enforcement actions as the highest coal producing counties in the state and among the highest in number of permitted operations.

Both charts illustrate the absence of Division performance standards for inspectors. Also absent is any evidence of an evaluation process that would identify inadequate performance and assure improvement or removal of poor inspectors.

Procedural Guidelines

Researchers found no clearly written DSM guidlines for inspectors regarding:

-- who may negotiate with the operator;

-- when and for how long these negotiations may take place;

-- who makes the judgment of an operator's "good faith"; and,

-- on what criteria such a judgment should be based.

Many examples cited earlier illustrate this absence of guidelines. The following offers further evidence:

> Kilby Family Mines, (#77-144, 76-2, 76-155), Morgan and Cumberland Counties
>
> The Kilby family obtained eight permits from 1972 through 1976. The seventh and eighth permits were issued in 1976. The following is a sequence of events affecting the final two permits.
>
> On January 7, 1976, the Kilbys were issued their seventh permit (76-2). On August 12, 1976, this site was reported as abandoned. Although no attempts were made to reclaim the area, the bond forfeiture notice for this site was not issued until June 20, 1978 -- almost two years later. The bond was not collected at that time.

One year later, June 5, 1979, inspector Bill Johnson reported three areas were regraded but without vegetation. He also noted that 7 to 9 acres adjacent to the permit site had been wildcatted by an "unknown party" he presumed to be the Kilbys.

June 20, 1979, a second notice of bond forfeiture was issued. As of March 21, 1980, (almost four years from when the site was abandoned) the Georgia Surety Company had partially reclaimed the area. The bond is being held by the Department of Conservation pending final reclamation.

The eighth permit (76-155) was issued on August 9, 1976, three days before the seventh permit site was declared abandoned. On August 18, 1979, Arthur Hope, Assistant Director of DSM, wrote a memo to staff attorney Claudius Smith detailing the four Kilby permits which were unreclaimed and noting ". . . a pattern of violations has developed which is evident to our field personnel relative to the George Kilby family in the surface mining of coal. These activities began prior to 1974 when the Kilbys were forced to get a permit for mining without one. At the time there were threats of bodily harm. The family is using different names to get a permit, then simply walking off and leaving the area unreclaimed."

Five months later, on January 28, 1977, the eighth site was abandoned, unreclaimed. On May 16, 1977, Area Supervisor Larry Stephens wrote a memo to Claudius Smith detailing the status of the seven Kilby sites. All were unreclaimed. He noted that ". . . in every instance they have done inadequate reclamation if any attempt has been made at all."

On May 20, 1977, the Department of Water Quality found the Kilbys wildcatting off the 76-155 permit area and ordered them to cease mining. No action was taken by DSM. Larry Stephens wrote in a memo to inspector Barry Smith dated May 25, 1977, that he was postponing action on the site until it was reinspected. That inspection occurred on August 3, two months later.

Throughout 1978 and 1979 continued failure to revegetate is noted. Two years after the site was abandoned, on November 8, 1979, a notice of bond forfeiture was issued. As of January 1980, the Kilbys bonding company was still in the process of hiring someone to do the reclamation.

Record Keeping System

The 1980 law requires denial of permit to any applicant who has had any surface mining permit suspended, revoked, or bond forfeited, has been issued a cease order for wildcatting which has not been overturned [T.C.A. § 59-8-313(i)], is in current violation of the law, or has demonstrated a pattern of willful violations causing irreparable environmental damage.

The law can be enforced only with a full cross referenced set of records on each permitted operation detailing all violations, the names of the operations, and the names of all corporation officers with 10% or more interest in the operation.

Researchers found DSM is managing its enforcement efforts without the aid of such records. Frequent violators are aware of this information gap and know they can escape the scrutiny and possible permit denial by simply changing the name of their companies when applying for a permit.

In instances where records of past violations are, in fact, on record at DSM, the information is not easily retrievable and so unavailable when needed to check a new permit application. The CWM example is an illustration.

CWM, (#80-211), Campbell County

In December 1979, CWM applied for a permit. It was not approved until nearly a year later when CWM posted the required bond.

Meanwhile, in March 1980, federal inspectors cited CWM for illegal mining and ordered the operation to stop.

Finally, in October 1980, a state inspector discovered the wildcatting activity and issued a cease order. One week later DSM Nashville office issued the permit to CWM. Officials issuing the permit said they were unaware of the Cease Order at the time they issued the permit. (Under 1980 state law, operators receiving a valid Cease Order are not eligible for a permit.)

Administrative Support for Inspectors

In their study of DSM inspection files researchers found instances of inspectors requesting administrative actions that were not forthcoming.

Eastern Energy, (#78-242), Bledsoe County

An inspection report dated July 25, 1979, reads as follows: "Each inspection report since February has requested an NNC and as of yet it has not been issued."

"Bond Forfeiture has been sought on this site by myself, the inspector, and by the Knoxville office for several months with no results as of yet."

In the following case, recommendations to supervisors from technical staff went unheeded and unsupported.

Dan Page, (#79-27), Overton County

Page proposed to strip an area of the Wilder Seam, a highly acid seam with toxic overburden as well. The staff geologist for DSM reviewed all five sites that had previously been mined on this seam. He found that problems of erosion and achieving initial vegetation were brought on by high soil acidity. Only five to ten percent vegetative cover had been achieved and a stream near a twenty year old orphaned mine still read a 2.8 pH. The geologist recommended a $6,500 per acre bond along with other stricter reclamation requirements. He noted, "at first glance this may seem extreme, but after observing the other sites and the reclamation problems associated with this seam, it is an appropriate amount."

> Two months later, the staff forester recommended a $4,000 per acre bond. Despite these recommendations, the permit was issued with a $2,500 per acre bond.
>
> Subsequently, the company was cited for violations which were not abated and they were issued a Notice of Bond Forfeiture seven months after the mining began.

These difficulties with administrative backup are compounded for field inspectors when their superiors are under pressure from powerful industry or political officials.

Political Pressures On Enforcement Personnel

This final section offers examples of the effect of outside pressure on enforcement personnel. Inspectors told researchers that the interference caused by these pressures comprise one of the most difficult aspects of their work. Following are three recent case studies which were widely reported in state news media.

> Carbonex Coal, (#80-81, 80-19, 79-308, 308A), Bledsoe County
>
> Between October 1979 and May 1980, Carbonex received seven Notices of Violations and three Cease Orders from the federal Office of Surface Mining. They received five Cease Orders from the state Division of Surface Mining including a citation for wildcatting and a permit suspension during the same time period.
>
> On June 11, 1980, officials of Carbonex flew DSM Director C. C. McCall and Deputy Commissioner Kent Russ in a company plane to an onsite meeting near Dayton, Tennessee. Russ had a radio message sent to Baker, the state inspector responsible for the area who was en route to the meeting, ordering him not to attend.
>
> Baker was quoted in the Nashville Tennessean as saying, "I had written up violations on the company and wanted to defend myself. Carbonex didn't want me on the site."

State Representative Bill Carter arranged a meeting between Commissioner Ann Tuck and Carbonex president John Keller regarding the company's protest against Baker.

Following this meeting, two weeks after the site visit, DSM Director C. C. McCall wrote company officials telling them that another inspector was being assigned to the site "in an effort to start afresh."

Baker considered it ". . . a lack of backing for inspectors in the field . . . a precedent that should not be set. Everybody said I was doing my job, including the director who took me off. If other companies get an inspector they will try to get rid of them in one way or another."

Judo Mining Company, (#74-108, 74-163), White County

Judo had three separate sites under two permits totalling 140 acres. Over three years elapsed between the permits' expirations and the first NNC for failure to reclaim. Another ten months elapsed before the Bond Forfeiture Notice was issued on February 7, 1980.

This Notice of Forfeiture was subsequently lifted after mine owner, Julius Doochin, and his consultant, former Department of Conservation Commissioner, "Buck" Allison, met with the DSM Director, C. C. McCall (who was initially hired under "Buck" Allison) on April 3, 1980. The outcome of the meeting -- Doochin was given a six month extension to reclaim.

Longwa, (#79-177), Morgan County

Longwa received a permit after receiving a Cease Order from DSM for knowingly wildcatting for thirty-five days. DSM granted this permit despite the new state law forbidding issuance of a permit to any company issued a CO for wildcatting in the state.

In this case, the Director of DSM, C. C. McCall, intended to uphold the law and deny the permit. However, the operators approached the governor's office and received help in persuading the Commissioner to overturn the cease order thereby removing the obstacle to Longwa's receiving any future permits.

Conclusions

The time elapsing between first Notices of Non-compliance for violations and final issuance of Bond Forfeiture Notices is unnecessarily long. Environmental damage and damage to the property and safety of nearby residents results when mine sites remain unreclaimed.

Inspectors are inadequately trained and poorly paid. Standards of good performance for inspectors are not operative and, in their absence, inspector's work varies widely. Individual inspectors who risk enforcing the law go unrewarded and those who rarely cite operators for violations remain in the division without evaluation.

Data given in this study offers evidence of uneven performance by inspectors. Some of the inspectors are clearly avoiding use of the enforcement actions available to them. Some DSM inspectors allow violations without giving citations and freely negotiate with operators for as long as they see fit. No guidelines or regulations govern the widespread pattern of negotiating with operators. The inspectors are able to adjust penalties, citations, deadlines, to suit the operator and can use their own discretion to judge the presence of good faith.

Operators who repeatedly violate the law and regulations know they can depend on the confusion and inadequacies of the division's record keeping system to avoid scrutiny.

The division's administrators offer little incentive to inspectors to more vigorously enforce the law. A single inspector is no match for a large coal company when the division behind him collapses under pressure.

Inspectors and technical staff often find administrative personnel ignore their recommendations for vigorous and immediate enforcement actions, higher bonds, bond forfeiture, etc.

Recommendations

Negotiations Between Operators And Officials

1. Strict guidelines should be developed. Every violation seen should be noted, an abatement date given, an inspection required on that abatement date, and, movement to the next enforcement action, if necessary. The new state regulations regarding ninety day limits for correcting violations should be strictly followed.

2. The fines available under the law should be used.

3. Specific agency people with rights to negotiate should be designated. Inspectors should not be free to negotiate.

4. Any negotiating of deadlines should be accompanied by a written report of evidences used by the negotiator to indicate the "good faith" of the operator.

Inspector Training, Performance Standards, and Evaluation

1. Periodic and systematic review of each inspectors' site records should be required. Spot checks on sites without forewarning inspectors should occur. All findings should be kept in files.

2. Periodic review of area supervisors should be established.

3. Guidelines should be established for inspectors clarifying a process of forewarning, probation, and finally removal for poor performance if it continues unimproved.

4. Because our research indicates inspectors Taylor and Clawson have failed to perform statutory duties, we recommend they be dismissed.

5. Inspectors should be given training in the law and technical aspects of mining. Education should be continual and regularly updated. The OSM program of inspector training is recommended.

6. Pay level should be increased to attract more qualified inspectors.

7. Inspectors should be given a limited number of sites. If too many are permitted, more inspectors should be hired, rather than overloading existing inspectors.

Procedural Guidelines and Record Keeping

1. A carefully cross-referenced, easily accessible file should be established detailing the names of coal companies, all corporate owners, operators, stock holders, and the records of violations (both those citations given by the state and the federal inspectors), and bond forfeiture of each.

2. The file should be used in assessing the "good faith" of operators when negotiations occur.

Administrative Support

1. Priority should be given to actions requested by the field inspectors.

2. Inspectors should be recognized for jobs well done.

3. Quality of area supervisors should be evaluated as carefully as that of the inspectors. Our investigation suggests special attention to be given Hope and Stephen in such an evaluation.

BOND FORFEITURE

According to several DSM inspectors interviewed, bond forfeiture is one of the only ways to "let the multiple violator know that he can't just get away with everything." The bond forfeiture law appears to have two basic purposes: it should act as an incentive to the operator to reclaim the mine sites; and, failing this first purpose, it should provide money to the state to carry out the needed reclamation. Statistics show that neither purpose is being carried out.

One hundred eight Bond Forfeiture Notices have been issued by the State between 1968 and October 1980. Of these, at least 88 sites remain unreclaimed as of this writing.

As An Incentive To The Operator

A Notice of Revocation and Order of Forfeiture reads as follows:

> You are herby notified and advised that pursuant to Section 58-1550 Tennessee Code Annotated, your surface mining permit, ________, is hereby revoked for failure to effect reclamation as required by a NOTICE OF NON-COMPLIANCE dated ________, and a SECOND NOTICE OF NON-COMPLIANCE dated ________. You are futher advised that your Performance Bond No. ________ is hereby forfeited.

> You are hereby further notified and advised that pursuant to Sections 58-1557 and 58-1558 Tennessee Code Annotated and the Uniform Administrative Procedures Act, Tennessee Code Annotated, Section 4-507, et seq. that you may have this decision of revocation and forfeiture reviewed by the Board of Reclamation by filing a written petition for review within ten (10) days of the date of receipt of this order. This petition should be addressed to the Office of Staff Attorney, Tennessee Department of Conservation, 2611 West End Avenue, Nashville, Tennessee 37203 and should simply state your desire for such review.

Despite the clear wording of this notice, negotiations between the enforcement agency and the coal operator continue after the notice has been issued. Consequently, issuance of this notice does not necessarily mean that the bond money will, in fact, be collected.

Issuance of Notice of Bond Forfeiture and collection of the bond money is usually held up while the operator and the state negotiate, a process carried out informally without guidelines provided by specific language in the law or regulations. Such transactions may last months, even years.

> Shu-ter, (#76-214), Sequatchie County
> In November 1976, Shu-ter received a permit for a previously mined area with the understanding that reclamation of the past mining must begin when the new mining starts.
>
> January, 1977, no reclamation had begun and the first NNC was requested. Inspector Sisson continued to request action and the first NNC was given Shu-ter in June, 1977.
>
> The next several months brought letters of explanation, requests for bond release by Shu-ter on an area not mined, blasting complaints from nearby citizens, and a continuation of the violation. By September, 1977, a second NNC was issued.

In April, 1978, Inspector Sisson requested bond forfeiture and the Notice of Bond Forfeiture was issued in May.

Letters were sent to DSM from citizens complaining about the site, and negotiations with the bonding company. Citizens received a letter from Commissioner Tuck assuring that the site will be reclaimed within the following year (1979). Inspector Sisson's reports continually plead for collection of the bond money.

January 1981, five years after the site was permitted, the site was still unreclaimed and the bond money uncollected.

The Richten Development Company, cited earlier, (p. 7) is another example of the 88 sites remaining unreclaimed.

Simple economics offers another explanation for the failure of bond forfeiture as an incentive to reclamation. For the coal operator, the money lost through bond forfeiture is usually less than it would cost him to do the reclamation himself. In spring of 1980, average bids for reclamation to the state were $3900 per acre. Yet, bonds are routinely set at $1000 per acre. The highest bond per acre that was found in the records of the DSM was the $2500 for the Dan Page permit cited earlier. The Richten permit, also described earlier warranted only $1000 per acre, despite the site being in serious violation from the outset. In May 1980, except for one case, all of the thirty companies appealing bond forfeiture before the Board of Reclamation Review held bonds of $1000 per acre.

The law clearly states that "no permit for surface coal mining or exploration shall be granted if . . . the applicant has had a Tennessee surface mining or exploration permit suspended or revoked or bond forfeited; unless the area . . . has been completely reclaimed prior to bond forfeiture by the responsible operator . . . at no cost to the state." [T.C.A. 59-8-313(i)(3)]. However, the researchers found that operators can avoid these consequences by negotiations that delay the collection of the bond money sufficiently to allow time to eventually accomplish the reclamation at their own expense. Suffering no consequences for delays that make good reclamation impossible on many sites, the operator is again fully eligible to receive a new permit.

The researchers also found cases where Bond Forfeiture Notices had been issued on unreclaimed sites but new permits were reissued when only a beginning reclamation effort had been made.

Finally, as explained in an earlier section, the DSM's inadequate record keeping system allows companies who have forfeited bond and left reclamation to the state to slip through scrutiny and obtain a permit. By law, any owner, director, partner, officer, or stockholder of 10% or more of the stock of a corporation who forfeits a bond and leaves the reclamation to the state is not eligible for a new permit [T.C.A. 59-8-313(i)(2,3)] DSM presently relies on the assorted memories of its inspectors to keep track of all such stockholders and relevant persons. DSM issues over 250 permits per year in 20 different counties. When a company's name is changed and/or moved to a different county, a permit can easily slip through the approval process. The following is a case in point:

> Custom Coal, (#76-120), Cumberland County
> Owners of this company are S.J. Waters and Bruce Peery. Their bond was forfeited on October 27, 1977 and the site was left unreclaimed.
>
> Bruce Peery, S.J. Waters, and C. Henry were granted a permit July 27, 1978, under the name of Resource Processors. On May 8, 1979, they were sent the Notice of Bond Forfeiture.
>
> From May until August 1979, a small amount of work on reclamation was done, but by August, the inspector was asking that the bond be collected.
>
> A second forfeiture notice was issued on September 25, 1979. By December 4, 1979, the inspector reported that, "at the rate of reclamation that has been done in the last month, it would take five years to finish the site."
>
> The last entry in the file, dated April 9, 1980, reports the site status remains unchanged.

As An Assurance Of Reclamation

In the event that the operator fails to reclaim, the bond money is intended to provide for reclamation of the abandoned land. The researchers found that this intention of the law is also frustrated by extended negotiations and inaction.

- Research shows that bonds are not usually collected.
- Out of 108 Notices of Bond Forfeitures sent by the state to operators from 1968 until October 1980, only 25 have been collected.
- Over and above the 25 collected, only 14 sites have either been reclaimed by the operator, or insurance company, or repermitted.

Researchers were told by the DSM staff that the Notices of Bond Forfeiture are sent to the DSM staff attorney for assessment, then sent on to the State Attorney General. During spring of 1980, thirty-one company's files were with the Attorney General and thirty-seven remained with the DSM Attorney.

Given that twenty-five bonds were collected by the state over the last eight years, it appears that, at this pace, collection of the remaining 68 will take about 22 years, if no new bonds are forfeited. The pace may move even slower in the future since, presently, the Division of Surface Mining is without a staff attorney and without prospects for one in the near future. The files in this office wait while the land affected becomes increasingly unreclaimable.

Research shows that reclamation is not carried out even in those few instances where the state has collected the bond money.

- Only 5 sites have been reclaimed by the state out of the total of 25 bonds collected by the state.*

- One and three tenths million is presently in the Reclamation Fund intended for state use in reclamation of sites on which bond has been forfeited.

Finally, it is currently the state's practice to reduce the bond by 70% once grading is completed. However, researchers found cases where bond was reduced prematurely.

> James Earl Nunley, (#76-93), Grundy County
> On this 46 acre site the bond of $46,000 was reduced to $30,000 on July 14, 1977 presumably because the operator had met grading requirements. Yet, on August 17, 1978, the inspector noted that grading was not on schedule. This violation continued to be noted throughout 1979. As of the last inspection on April 1, 1980, no work had been done on the area since 1978.

Also found were situations like the following where total bond release occurred before the reclamation was complete.

*Data collected as of November, 1980.

Thunder Mountain, (#68-88), Anderson County

Thunder Mountain Coal Company applied for a permit to surface mine on November 15, 1977. Their application was contested by the town of Lake City which was concerned about its water supply, as well as a number of local citizens near the proposed site. The permit was issued early in 1978 with the stipulation that no mining be done within the Lake City watershed area.

Thunder Mountain subcontracted RUEL Coal Company which proceeded to mine off the permit area into the watershed. Subsequent complaints resulted in an inspection and the issuance of Cease Order #454 on December 11, 1978. The inspection found drainage basins to be destroyed or non-functional, a large disturbed area beyond the permit boundary, a 100 foot highwall left unfilled, and other numerous violations.

Due to the bankruptcy of RUEL Coal Company, Thunder Mountain Coal Company, the permittee, was held responsible for the violations and reclamation work. The Federal Office of Surface Mining also issued Notice of Violation on December 28, 1978 and then a Cease Order on March 27, 1979 for failure to abate the violations. On December 11, 1979, OSM again issued a NOV for failure to abate six existing violations, but on December 20, the State DSM reduced the reclamation bond on the site from $15,000 to $11,400.

After this action, OSM again issued a Cease Order on March 7, 1980 for failure to abate five of the six violations cited on the previous NOV. OSM then proceeded to hand the case over to their attorneys for further action. While OSM action was still pending, a state inspection was held on August 26, 1980, by forester Fary Zimmerman. Zimmerman cited the following deficiencies: 1) a 60' highwal on the southeast portion of the site, 2) a small unfilled rut, 3) an 80% vegetative cover on the rest of the permitted site, 5) unreclaimed acreage adjacent to the highwall, 6) no trees on the outslopes, 7) additional reclamation outside the permit area. State inspectors determined that the highwall and rut were part of the original permitted acreage and clearly the responsibility of Thunder Mountain. Zimmerman then recommended that of the 15 permitted acres, eight met total bond release, six met grade bond release but not vegetative requirements, and one was unreclaimed. This did not include any unreclaimed disturbance done by RUEL outside the permit area.

On September 30, 1980, with OSM action against Thunder Mountain still pending and with a state inspector's recommendation that only eight acres met total bond release, Director C. C. McCall released the entire bond on the site.

Conclusions

The setting of bond rates at below the cost of reclamation is part of a cycle. When bonds are set low, operators have less financial incentive to reclaim or to reclaim well; the Division of Surface Mining is hesitant to forfeit the bond because it is inadequate to fund a state reclamation effort and so continues to negotiate with the operator and extend deadlines. As time passes, the site deteriorates to a point where reclamation costs are higher than at the outset and inflation decreases the capacity of the bond to cover the actual costs.

The state's practice of reducing the bond by 70% once grading is completed fails to consider the resulting erosion when grading is completed and seeding is left undone. The practice also fails to provide an economic incentive for operators to achieve permanent vegetative cover on the site.

Collection of bonds is bottlenecked in the Attorney General's office. The resulting delays make it easy for operators with unreclaimed sites and Bond Forfeiture Notices who know they have a very long tim available for moving forward on reclamation. The state has too few attorneys to carry out the work of bond collection.

The issuance of the Bond Forfeiture Notice is meaningless and ineffective. Despite the clear wording of the Notice, bond money is usually not collected and the operator has plenty of time to negotiate informally. It serves only as a warning, if that.

The state allows over a $1,000,000 in the strip mine reserve fund to collect interest in the bank rather than using it for the purpose intended -- reclamation of abandoned mine lands.

Recommendations

1. Additional legal help for the Division of Surface Mining and/or the Attorney General's office so bond forfeitures can be processed in a timely manner.

2. Begin the process of bond collection immediately after passage of the ten days appeal time following issuance of bond forfeiture notices.

3. Once sent, there should be no more negotiating and delays allowed except at the official appeal level described in the notice.

4. Insurance companies must be given specific deadlines to either give over the bond money or complete the reclamation.

5. Grade bond release percentages should be lowered.

6. Bond amount should be increased sufficiently to cover the cost of adequate reclamation.

7. The past record of the operator should be used as information in setting the bond amount and the reasons for the amount set should be written in the record.

8. The state should begin using the money presently in the reclamation fund for its intended purpose.

BOARD OF RECLAMATION REVIEW

Description of Responsibilities

The Board of Reclamation Review is a five member administrative board that hears appeals from mineral owners, operators, property owners or other interested parties aggrieved by orders, determinations, regulations, permit terms, or rulings of the Commissioner of Conservation, which in any way affect exploration of surface mining in the state. [T.C.A. § 59-8-321(f)]

State law requires the governor to appoint two members from the public at large, "neither of whom shall have a financial interest in the mining industry nor in any related business;" and two members who are representatives of the mining industries." [T.C.A. § 59-8-321(a)] The fifth member is the Commissioner of Public Health, or his designee.

Present board members are: Steve Roberts, a teacher in the Knoxville school system; Roger Kelsey, attorney for Baker, Worthington, Crossley, Stansberry and Woolf, a law firm with offices in Knoxville, Huntsville and Nashville which has represented coal interest; Eugene Fowinkle, Commissioner of Public Health; Ralph Ross, dentist and partner in Dean Coal Company; and Carl Rice, owner of the Royal Gem Coal Company.

One recent example of the Board's dealing with a civil penalty assessment involves Longwa Mining Company. Longwa was found mining after its permit expired and was first fined $75,000. The fine was reduced by the Division to $45,000, but was still appealed by the company. The Board of Reclamation Review then reduced the fine to $3,000.

The Tennessee Surface Mining Act designates the Director of DSM as the technical secretary, who is responsible for reporting the proceedings of the baord, scheduling hearings, and other duties required by the board. The board is required to keep "a complete and accurate record of the proceedings of all its meetings," and a copy of such records are to be kep in the director's office, "open to public inspection." [T.C.A. § 59-8-321(e)(d)]

Research Procedures

Researchers reviewed the records of 28 board hearings. Out of these, minutes of the proceedings were available in only 13 of them. Department attorney Relis Fleming said cases requiring legal action after a board decision (e.g., collection of forfeiture) are sent to the State Attorney General's office. Apparently, that means the whole file is transferred with no copy retained by DSM. Upon inquiry to the Attorney General's office, an assistant informed researchers that once the file reaches that office, the records are "privileged and confidential" and "are removed from the public record."* Through more negotiation, copies of these records were finally made available to researchers.

Hearings before the board have involved appeals by 30 coal companies: 27 were hearings on bond forfeitures, two on

*Telephone conversation with Claudius Smith, Assistant Attorney General, June 10, 1980.

permit denials and one an appeal of a cease order. None of the hearings before the board have been actions brought by citizens.

Effectiveness of the Board

Since most of the cases involved appeals of bond forfeitures ordered by the commission, further information on these cases was documented.

1. Nine of the 30 companies were cited for multiple violations and forfeitures involving 39 permits.

2. The number of acres affected by these permits totaled 1,114.

3. In all cases, bond was set at $1,000 per acre.

4. Only four of the 39 permits revoked have been adequately reclaimed.

5. The average time from the first notice of noncompliance to action by the commissioner to forfeit bond was 264 days, ranging from 55 to 658 days.

6. The average time from the first notice of noncompliance to a board hearing was 465 days, ranging from 138 to 1358 days.

Board Case Load

The 1980 Surface Mining Act changed the law to allow assessment of administrative civil penalties against operators. Because of that change, operators will probably ask the board to review the assessment of those penalties which will greatly increase the number of cases brought before the board.

Another law change likely to result in an increased number of appeals to the board is T.C.A. § 59-8-331, which allows citizens to petition the state to designate areas unsuitable for mining.

Conclusions

There is an excessive time period between issuance of an NNC and the Board hearing date, during all of which time an area remains unreclaimed.

Including coal operators and other coal-related interests (e.g., lawyers on retainer to coal companies) constitutes a conflict of interest when this board deals with cases involving civil penalty assessments, issuing or denying permits, designating lands unsuitable for mining, and recompending changes in policy, laws, and regulations.

Recommendations

1. That a hearing, timely requested, be scheduled without long delays, so that reclamation bids can promptly be let out on the site.

2. That all coal operators and others with a financial interest in mining be removed from the Board.

WILDCATTING

The "Study of Tennessee Strip Mine Enforcement, 1972-1977" states that wildcatting, i.e., mining without a permit and plans, is the "biggest problem confronting strip mine enforcement in Tennessee." Since the report was published, wildcatting continues to be a serious problem.

Enforcement Actions Available Under the Law

When a DSM inspector discovers wildcat mining the following actions are available.

1. Cease Order: The Cease Order demanding cessation of mining activity is handed or mailed to the party thought to be associated with the illegal mine.

If the wildcatter continues to mine after receiving a Cease Order, DSM turns the case over to the state attorney general's office for legal action. This generally means a temporary restraining order followed by an injunction.

2. Civil Penalty: Until the passage of the 1980 Surface Mining law, DSM had to take a wildcatter to Chancery Court to receive a fine. Since the 1980 law, the Commissioner has the authority and is mandated the responsibility to fine wildcatters anywhere from $100 to $5,000 for each day of wildcatting.

3. Criminal Penalty: According to the 1980 Surface Mining law, the state can convict a wildcatter with a felony and fine him from $1,000 to $10,000 or imprisonment of up to three years. Until 1980, this penalty was not available.

Enforcement Efforts

Wildcatting violations have occurred with the full knowledge of DSM inspectors and officials and no accompanying action. In some cases it is evident that state inspectors consciously choose not to issue cease orders when wildcatting is occurring.

J. L. Lay, Campbell County

> On September 15, 1978, inspectors Joe Clawson, Eddie Reynolds, and John Black inspected an illegal mining operation run by J. I Lay. Though at least 180 tons of coal had been removed and stockpiled, the inspectors all agreed that no action need be taken. (Twenty-five tons is the legal limit for extracting coal without a permit.)
>
> As inspector Black explained in his report: "The work that he (Lay) is doing, I feel, will vastly improve his property. Mr. Lay stated he had removed about 180 tons of coal. That would not even pay for his fuel bill. . . . My job as an investigator with the Surface Mining Division is to try and control illegal surface mining. But in regard to Mr. Lay's operation, I do not feel that he should be denied the right to improve his own personal property. Therefore, I do not recommend any action be taken to stop his improvements."

The 1980 Strip Mine Act of Tennessee, enacted in May 1980, now states that an inspector must issue violation notices and/or cease orders upon seeing a violation. [T.C.A. § 59-8-317(a)] However, not all inspectors are complying with the law.

Lonnie Hatmaker, Campbell County

> Inspection reports show that special investigator John Black advised inspectors Ragon and Reynolds against issuing a Cease Order when they discovered Hatmaker had mined off his permitted area on August 25, 1980. Only after citizen complaints and a news report of DSM's failure to issue a Cease Order was an Order finally issued.

Hamblin Coal Company, Claiborne County

A state inspector, Joe Clawson, and a federal inspector both visited the Hamblin Company strip site, October 20, 1980. The federal inspector reported wildcat mining while the state inspector reported the mine was in full compliance with the law. Though the coal operator made no attempt to hide the fact that mining was continuing without a permit, the state inspector reported, "reclamation is the only activity on the site at this time."

Federal inspection reports are regularly sent to the Division of Surface Mining. Despite the information from federal inspectors reporting Hamblin's wildcatting, the state issued the company a new permit November 17, 1980.

Citizens' complaints about wildcatting in their areas brings little response from DSM.

Walden Hollow Wildcat Site, Campbell County

In June 1980, a complaint was made to DSM about suspected wildcatting in the area of Walden Hollow. Explosive trucks, several tractors, and coal trucks had been seen coming and going from the area. After no response the citizen repeated her request for an inspection in July and again in August.

In September, she redirected her complaint to OSM. About the same time, DSM inspector, Joe Clawson, finally responded to the earlier complaint with a letter dated September 3, 1980, stating he had made an investigation on August 29, 1980, and found no sign of mining.

The OSM inspection on September 12, 1980, however, found clear signs of wildcatting for which several NOVs were issued.

Legal Procedures

DSM files show that the issuance of a Cease Order does not deter a wildcat miner. All enforcement actions beyond the Cease Order are made at the administrative level. These may come in the form of fines or legal actions. A civil penalty fine presents one option to the agency seriously trying to curtail wildcatting. However, in the twelve years of DSM's existence, wildcatters have been fined only five times. Four of these fines totaled only $10,750; one fine was for $45,000, (later reduced to $3,000 after appeal to the Board of Reclamation Review).

Until the new state Act enacted in May 1980, the DSM had discretionary powers to pursue fines. The only means for assessing the fine was through chancery court with the Attorney General. Though the Commissioner rarely pursued this route, on those occasions when a suit was filed, the case was usually settled out of court with the wildcatter agreeing to reclaim and stop wildcatting.

The fines that have been assessed have been small sums compared to the income made by the wildcatter in sale of coal. Until the recent case of the $45,000 fine, $5,000 was the highest fine ever charged a wildcatter. When compared to the $45,000 that can be gained from an average wildcat site of three acres (estimating a 12" seam producing 3,000 tons selling at $15.00 per ton) this fine is merely a symbol, not a deterrent.

Section 18 of the State Strip Mine Act of 1980 gives the Commissioner authority to assess fines without having to go through the courts, and thereby making the process simpler and more feasible. In cases of wildcatting, the Commissioner is required to assess a fine of not less than $100 and nor more than $5,000 for every day of illegal mining. The Commissioner is to assess a fine within thirty days of the issuance of a Cease Order and notify the operator. The deadline for assessment has passed on all 25 Cease Orders issued between May and November 1980, without any such action on assessment. These cases, therefore, will go unassessed.

As has already been mentioned in the section on the Board of Review, in the one case where the Commissioner did assess a fine, the company, Longwa, Inc., (p.44) got a substantial reduction from the original $75,000 fine to $45,000 after "behind closed door" sessions between Division officials and representatives of the Governor's office arguing on Longwa's behalf. After an appeal to the Board of Reclamation Review, this fine was further reduced to $3,000.

As quoted earlier, T.C.A. § 13(i)(5) of the new State Act offers an important deterrent to wildcatters:

> No permit for surface coal mining or exploration shall be granted if the applicant has conducted exploration or surface mining operation disturbances without a permit, after the effective date of this act, for which a cease order has been issued, unless such cease order has been administratively or judicially overruled.

Already, this section of the law has been applied inconsistently. Within a period of one month, three companies were granted permits though they had previously received Cease Orders for wildcatting. Hamblin Coal Company, cited earlier, (p.41) and the CWM Company, (p.19).of this study both received permits after issuance of a Cease Order. The Longwa Company also recieved a permit after a Cease Order which was administratively overruled.

Longwa, Inc., Morgan County

> This company is owned by Jack Walls, one of the largest coal brokers in Tennessee, and A. B. Long, owner of a major construction company in Tennessee. (Both were campaign contributors to Alexander's race for governor.) On September 23, 1980, DSM inspectors issued a Cease Order because Longwa was continuing to mine though their permit had expired and a new one had not yet been approved. Immediately, Long, Walls, and one of Longwa's lawyers started meeting with Conservation officials and the Governor's office. Keel Hunt, Alexander's advisor on energy affairs, and Julia Gibbons, his legal counsel, paid some visits to Conservation Department officials in an effort to resolve a way to avoid denying Longwa's permit application.
>
> After two meetings and several phone calls, the Department decided to overrule the Cease Order and reissue the permit, much to the opposition of DSM officials who stated in a news article that the law should be uniformly applied.
>
> This particular Longwa mine had a TVA contract which could have been cancelled had TVA found out about the Cease Order and wildcatting. But, the Department, after overruling the Cease Order also backdated the permit renewal to make it appear as though no time had elapsed between the 1979 and 1980 permits and therefore, no illegal mining had occurred.

The Division of Surface Mining can also seek injunctive relief through the courts if an operator continues to mine after receiving a Cease Order. The miner may be ordered to discontinue mining and begin reclamation. Some miners ignore even the court ordered injunction and continue mining after hours and on weekends when they know inspectors will not be around.

The new provision in the state law making wildcat mining a criminal offense, punishable by fine and/or imprisonment could be an effective deterrent. (Section 18a)

One consideration to keep in mind, however, is that the decision to press criminal charges is totally in the hands of the local District Attorney's office rather than the State Attorney General's office. If the Attorney General's office wishes to vigorously pursue this route, it can only try to pursue the local District Attorney, who currently has very little to do with wildcat enforcement, to take on the cases. If the caseload is already full, and his priorities do not include mining prosecution, it may be safely predicted there will be few wildcatting criminal cases seen in the courts.

Another consideration is that these cases will have to take place in the county where the crime has been committed, and heard by a jury, which may prove to be difficult factors when it comes to finding unbiased jurors.

In general, the legal route is not a quick or efficient deterrent to wildcatting. Legal efforts involve long delays, legal maneuverings, etc. But, until the State starts to apply the law across the board and vigorously wildcatters will continue knowing they are on the winning side of the gamble.

Conclusions

Wildcatting continues to be a serious problem for DSM. Though there has been an increase in administrative and legal action against wildcatters, negligent enforcement and sluggish legal proceedings encourage continued illegal mining. As of the completion of this study, the state has yet to fine the most notorious illegal miner, Robert Hatmaker. This case was reported in the 1977 SOCM Enforcement Study as an example of inadequate enforcement action against wildcatters.

The state is inconsistent in its action against wildcatting, issuing cease orders to some, ignoring others. Citizens' complaints have not resulted in speedy action, making it discouraging for those who are affected and need protection. Though the law calls for automatic fines in cases where Cease Orders have been issued, the state has failed to assess fines for a vast majority of wildcatting cases. Without diligent enforcement, the wildcatter sees nothing to lose and everything to gain.

Finally, because state enforcement against wildcatters lacks seriousness miners abiding by the law see the financial advantages to avoiding the legal process.

Recommendations

1. Section 13(i)(5) of the Act regarding no permits if an operator received a Cease Order should be strictly enforced, even when the Cease Order is given for mining after a permit has expired or mining before a permit has been received. All mining without a permit is illegal.

2. Confiscation of equipment would be the most effective deterrent against wildcatting.

3. Administrative fines should be imposed on every single case given a cease order for wildcatting.

Senator **Warner**. Very persuasive testimony. You have a very interesting phrase in there about implying that we should establish some standards which the State should meet before this transfer responsibility from Federal to State takes place. Do you have some suggestions as to the type of standards that you would recommend?

Ms. **O'Connell**. Well, there are some standards that are real clearly spelled out in the permanent regulations, things that are to be considered, and there is a lot of detail about the kind of narrative sections about the size of inspection force, with the capability to enforce the act that is required for States to submit, and I think one of the things we are asking is that that really be looked at closely, and if the State of Tennessee does not have the sufficient number of staff or quality of staff to do that kind of enforcement, one thing we would like, although it is not in the permanent regulations, to have information like what I have presented today in terms of enforcement records of the State looked at by the Office of Surface Mining as one part of judging whether or not——

Senator **Warner**. That is a valid point.

Are you able to comment on comparability in other States of the record that you have portrayed on behalf of Tennessee?

Ms. **O'Connell**. I would have to have, I think, citizens speak for themselves in other States. I am aware of hearing a number, because I live about 3 or 4 miles from the Kentucky line. I have heard a number of other citizens in Kentucky talk about the problem of wildcatting. I don't know whether Ms. Swigart or someone from Kentucky might want to address that. I can tell you hearsay, things I hear from citizens throughout the coalfields have problems with enforcement efforts in their State agencies. The statistics I can only tell you from Tennessee.

Senator **Warner**. Mr. Wampler, do you have any questions?

All right, our next witness will be Mr. Fitzgerald.

Mr. Fitzgerald, let's make certain the record accurately reflects your organization. I was unable to write it down in my notes.

My suggestion is to get that old microphone close to you; it is a good friend, believe me. A lot of folks want to hear what you have to say.

STATEMENT OF THOMAS FITZGERALD, STAFF ATTORNEY, APPALACHIAN RESEARCH & DEFENSE FUND OF KENTUCKY, INC.

Mr. **FitzGerald**. My name is Tom FitzGerald. I am a staff attorney with the Appalachian Research & Defense Fund of Kentucky, Inc., which represents low-income individuals and groups in eastern Kentucky's coalfields who are adversely affected by abusive strip mining practices. By way of introduction, I represent the citizens and environmental interests on the Primacy Task Force established by Secretary Swigart to review and aid in developing the Kentucky regulatory program. My comments, tendered in response to the invitation of this subcommittee, are endorsed by the Kentucky Conservation Committee.

I applaud the subcommittee for bringing this hearing out of Washington and into the coalfields. I offer a word of caution—the subcommittee must proceed thoroughly and cautiously, separating rhetoric from reality, in assessing the implementation of Public Law 95–87 thus far. We stand at a crucial juncture in our attempt to foster a responsible coal industry in the eastern coalfields—the most critical phase of a process that has taken over a decade. The wrong message of this juncture will certainly result in another generation of abuse of human and natural resources, which this region and Nation can ill-afford. It will lead the industry and recalcitrant States to assume that it is open season on Public Law 95–87 and on environmental protection, and that Congress will bow to the caprices of those most irresponsible within the industry and regulatory agencies.

A fundamental question framed by any oversight process is whether there is a need for legislative change in the organic act. The best answer that can be given is that there should be no such change in 95–87, because no such change is needed or desirable in this crucial period of implementation of the act.

The Surface Mining Control and Reclamation Act is working in eastern Kentucky's coalfields and the hills of West Virginia. There have been some abuses in my State, most notably a dubious policy of granting on-site construction exemptions from the act which fostered widespread abuse and created new orphan land, but the policy was ended through the administration process by the current Secretary of our Department for Natural Resources. Similarly, the abuses occasioned in the Commonwealth of Virginia by the operators who focus their energies on circumventing the intent of Congress rather than on developing reclamation technologies, will require correction. But the regulatory agency is more adept and capable of fleshing out the act and monitoring its implementation, and of correcting perceived problems when they arise. Overall, the act is functioning as Congress intended, and is demonstrating that coal can be dug and land reclaimed in a manner that minimizes the threat to human safety, health and the environment—that a liveable environment in the coalfields is not incompatible with a truly healthy industry.

Any consideration of legislative amendments to 95–87 is premature at this point in time, also. With the recent decision of *Hodel* v. *Virginia Surface Mining and Reclamation Association*, June 15, 1981, the first and most crucial test of the act has been won. Those irresponsible segments of the industry who have attempted to avoid any responsibility for health, safety, and environmental protection; who seek to dilute the act and thwart the mandate of Congress, will surely use any legislative consideration of Public Law 95–87 to weaken and subvert, rather than strengthen it. The net result would return us to the unacceptable state of affairs before the enactment of Public Law 95–87. The result would be chaos in those States where the responsible segments of the industry, the States, and the affected public, have come so close to implementing a workable program under Public Law 95–87.

Kentucky is one such State where substantial efforts have been made to implement a program in accord with the mandates of Public Law 95–87. Citizens, industry, and the State have labored long and hard to hone out a regulatory program which will foster a strong, responsible industry. We find our efforts thwarted by the new direction of the Interior Department and the Office of Surface Mining, which appears to be ill-conceived and hasty efforts to cater to the most irresponsible operators. The dismantling of OSM and rewriting of the act by regulatory fiat is an affront to this Congress and to the citizens of the coalfields.

Within the space of half a year, OSM has proposed sweeping revisions of most of the permanent program regulations, shattered the requirement that the State regulatory programs implement the Federal act and regulations, leaving a skeleton which faintly restates the broad mandates of the act where there was once a program for fleshing out, implementing, and enforcing those mandates. Design criteria have been excised from the regulations, leaving the responsibility for assuring compliance with the performance standards in the hands of an industry and engineers who cannot and will not guarantee their work product—the proposals grant freedom and flexibility without responsibility. The end result is a regulatory anarchy.

The proposals, under the rubric of eliminating repetitive, redundant and unduly burdensome regulation, strike at the heart of the act by hampering inspection and enforcement, and impermissibly chilling citizen involvement in the act's implementation and administration. The breakneck, helter-skelter approach to regulation revision and promulgation currently underway at OSM reflects a contempt for the role of citizens affected by mining are to play in the regulatory process. The willingness of the agency to compromise itself on many important issues with the worst of the industry stuns the citizens, the States, and responsible industry. It is an affront to those who have suffered from strip mining abuses, to this Congress, and to the industry itself, whose real economic interests are served by internalizing the human and environmental costs of mining rather than forcing the coalfields' citizens to bear them.

The performance of the Kentucky Department for Natural Resources and Environmental Protection stands in marked contrast to that of OSM recently. Kentucky has moved forward at a good pace toward a balanced, acceptable program incorporating the minimum standards of the act and regulations, while providing all affected groups ample public participation in the process. By doing so, the State will go far to erase the vestiges of abusive mining from our borders, to the benefit of all. I have attached comments on the present Kentucky program, which reflect that it is in tune with the mandate of the act. I have attached as addenda other comments tendered on some of the proposed OSM rulemakings—they are illustrative of the dangerous path being traveled within OSM.

The assault on the act has taken another tack, as well. The reorganization of the Office of Surface Mining is a flagrant attempt to thwart Federal oversight under the permanent regulatory program, by collapsing an efficient, decentralized regional approach in favor of another Washington-based bureaucracy. The field offices proposed by the reorganization plan will be isolated and susceptible to pressure both from industry and the States.

The act is undergoing a period of revisionism in the Interior South building on Constitution Avenue. Motivated by either a failure to appreciate the problems associated with surface mining, and the concomitant failure of the State to come to grips with those problems on their own, or by a deep cynicism, the thrust of the act is being altered. An act based on enforcement of national performance standards is being jettisoned for a "superlibrary" of technicians to assist industry. The assumption is that the industry will do the best job voluntarily provided the technical expertise is available. The history of the industry belies this fantasy, and any program based on such assumptions cannot be squared with the act or the past.

The intent of Congress is being thwarted from within, by those sworn to uphold the act, who are presuming to rewrite the act by regulation. I urge the subcommittee to focus on the failure of OSM and Interior to implement and enforce the act, the real threat to the coalfields and their citizenry.

[Attachments to Mr. FitzGerald's statement follow:]

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COMMENT ON PROPOSED RULES AMENDING 30 C.F.R. §730.5, §731.13 AND §732.15

This comment is tendered on behalf of ARDF clients in the Kentucky coalfields who have suffered from abusive coal extraction processes in their lives, and who have worked long years at great personal cost for the passage and implementation of a strong federal surface mining act and program.

The author of this comment incorporates by reference and supports fully the comments tendered by L. Thomas Galloway on behalf of the Environmental Policy Institute, et. al. of May 8, 1981 on the "draft" form of the proposed rules. The author concurs with counsel for EPI, et. al. that the proposed rules impermissibly infringe on the function of the Congress by attempting to rewrite the clear mandate of §503(a)(7) of the Act.

The Act sets out a unified standard of similarity for approval of a State program. It is impermissible to assume that only the state law must closely resemble its' federal counterpart, and that the regulations may vary widely from the federal regulations so long as they are as effective with regards to the Act.

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Leaving aside, for the moment, the impossibility of enforcing the "effectiveness" standard and the incredible abuse which will certainly follow under state programs approved under the proposed rule, the proposal creates two standards for approval where only one exists. If the use of the term "in accordance with" to describe the degree of similarity required between the federal law and approvable state law in §503(a)(1) and the use of "consistent with" in §503(a)(7) to describe the degree of similarity between the Secretarys regulations and those of the State, rather than the use of one word for both circumstances is, in retrospective, ill-advised, it does not provide the foundation for different scrutiny of the state regulations.

Throughout the Act and legislative history it is clear that the current approach of 30 CFR §730.5, utilizing one definition for both phrases, was that envisioned by Congress, and further that the one standard mandates substantial similarity unless local conditions (physical, not political) required state alternatives.

The proposed rule retains the language of present 30 CFR 730.5(a) which defines "in accordance with" and "consistent with" to mean, with regards to the Act, that

> The State laws and regulations are no less stringent than, meet the minimum requirements of and include all applicable provisions of the Act. 30 CFR 730.5(a)

The rule then posits that, with regards to regulations, "consistent with" requires only comparable effectiveness of the state regulations and those of the Secretary, when judged against the Act, rather than the consistency of the two sets of regulations with each other, plainly required by 503(a)(7). This analysis relies on a misassumption that there is a lesser standard where the regulations are concerned. The use of "accord" and "consistent with" to cover both the laws and regulations, by Congress, belies the assumption.

Section 701(25) of the Act defines and "State program" to be one

> [E]stablished by a State pursuant to Section 503 to regulate surface coal mining and reclamation operation on lands within such State in accord with the requirements of this Act and regulations issued by the Secretary pursuant to this Act. [emphasis supplied].

The definition clearly supposes the existence of one standard of approval for both state laws and regulations, consistent with the underlying principle of the Act that minimum uniform national standards for surface mining be met by all states wishing to assume primacy. §§101(g), 102(a), 201(c)(9), 503 (a)(1),(7).

The recent decision in Hodel v. Virginia Surface Mining and Reclamation Ass'n, _____U.S._____ No. 79-1538 (June 15, 1981), further supports the position that the state must provide laws and regulations consistent with those of the Act and Secretary.

> Under §503, any State wishing to assume permanent regulatory authority over the surface coal mining operations on "non-Federal lands" within its borders must submit a proposed permanent program to the Secretary for his approval. The proposed program must demonstrate that the state legislature has enacted laws implementing the environmental protection standards established by the Act and accompanying regulations, and that the State has the

> administrative and technical ability to enforce these standards. 30 U.S.C. §1253. [emphasis supplied].

Hodel, supra, at _____. The language of the Hodel decision demands that the state must develop a program implementing the federal regulations, not "approaching," "approximating," or being as "effective" in meeting the requirements of the Act."

The Conference Report of H.R.2, The Surface Mining Control and Reclamation Act of 1977, (H. Rep. 95-493, 97th Cong. 1st Sess.) erases any doubt that there are two standards for approval, or that the state needn't provide a regulatory approach consistent with that of the Secretary, where it states:

> The conferees agreed to clarify the language of the bill dealing with the consistency of state laws and regulations with the Federal laws and the Secretary's regulations. They adopted the principle of the Senate amendment that an approved state program requires (a) a State law consistent with the Federal law and (2) state rules and regulations consistent with the Secretary's regulations. The Conference Report retains the basic principle that the Federal law and regulations are minimum standards which may be exceeded by the States.

Id., at 102.

There remains no doubt that there is but one uniform criteria to be applied in gauging the approvable program; that it is no less stringent (though it may be more so)*, and meet all the applicable requirements of the Act and regulations.

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*H. Rep. 95-493 at 102, 109; §§505, 518.

The standard is one of consistency throughout, not of "effectiveness" as to the regulations.

The "State window" provision is a useless appendage for a rule which cuts the mooring of the state program and allows it to drift far afield of the Act without rudder or compass. Congress spoke to an issue which had been ill-addressed by the states for years; the statute was designed to "establish a nationwide program"** to control effects of surface mining, because of the failure of the states to do so due to various political and economic pressures.[+] The proposed elimination of the 30 CFR 731.13 requirement that the state program alternatives be justified by local needs violates the mandate of §503(a)(1) and (7), and of §201(c)(9). Against a backdrop of national performance standards and procedures for surface mining operations, the Congress recognized that the physiographic differences among the coal regions would necessitate a degree of flexibility in approach for the enforcement of some performance standards. This is reflected in §201(c)(9) of the Act, which authorizes the Secretary to

> assist the States in the development of State porgrams for surface coal mining and reclamation operations meet the requirements of the Act, and at the same time, reflect local requirements and local environmental and agricultural conditions; . . . .

The implication of this authority is that the Secretary was to assure first that the state program met the §503 mandate,

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**30 U.S.C. §1202(a)

[+] §101(g)

and that, consistent with the requirements of §503, certain alternative approaches justified by local requirements and environmental conditions. 30 CFR 731.13 directly addresses that need for flexibility, as Congress envisioned it. The proposed "opening" of the state window will undermine the foundation upon which the entire regulatory scheme of PL 95-87 rests.

Finally, the author of this comment reiterates the concerns expressed in the comments of the Environmental Policy Institute, et. al. of May 8, 1981, regarding the meaning and limitations of flexibility of "as effective as." I believe that drafters of the proposed rule should respond to the hypothetical questions presented and that the preamble should contain a far more specific definition of the term than is presently attempted. The term might be relatively innocuous or deadly; the vague definition and foggy conceptualizing presently offered by way of elucidation opens the door to certain abuse.

Respectfully Submitted

Thomas J. FitzGerald

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COMMENTS ON PROPOSED REVISIONS OF PERMANENT PERFORMANCE STANDARDS RELATING TO EXPLOSIVES, IMPOUNDMENTS, BACKFILLING AND GRADING, AUGER MINING, COAL WASTE, AND ROADS

The comments of the Appalachian Research and Defense Fund of Kentucky, Inc. a Legal Services Corporation grantee providing legal assistance to low-income individuals and groups in the eastern Kentucky coal fields, have been solicited by Mr. J.S. Griles, Acting Director, Office of Surface Mining, Washington D.C., by letter of July 9, 1981. The comments which follow represent the position of our clients, who have borne the burden of improper surface mining techniques, and have suffered from shoddy regulatory practices in the past.

These comments are endorsed by the Kentucky Conservation Committee.

INTRODUCTION

The rationale behind the combining of the above-mentioned proposed rules into one document for purposes of response and comment, is very simple. The above-mentioned rules suffer from

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a common ailment, the most obvious symptom of which is the lack of detailed design criteria. The underlying malaise is more difficult to diagnose, since it may flow from a lack of understanding of the problems associated with surface mining, or may be an attempt at "revising" the purpose and intent of the Surface Mining Control and Reclamation Act of 1977. Whatever the root cause, the current tack proposed by the drafters, under the auspices of eliminating "excessive, redundant and burdensome" regulations threatens the integrity of the substantive performance standards and goals of the Act.

DISCUSSION

The proposal of the drafters to remove the "design criteria" present in the current regulations cited above is an ill-conceived idea which threatens to undermine the successful enforcement of the performance standards established by the SMCRA.

The rationale for the deletion of specific design criteria in favor of performance goals and "Technical Handbooks" is reflected in the proposed revisions of the regulations regarding disposal of excess spoil and underground development waste, and bears repeating at length here:

> The regulations as now proposed have eliminated most of the specific design criteria present in the regulations promulgated on March 13, 1979. It is thought by the Office that the proposed regulations will allow much more innovative designs by the professional community serving the mining industry. Under the

> proposed regulations, industry should be able to take advantage of specific or unique site conditions to produce an operating plan and design that will significantly reduce the cost of construction on many excess spoil fills. The Office is of the opinion that the details and specific design criteria that have been eliminated are best left to the responsible professional engineers in charge of design and construction. [Emphasis supplied].

The logic of the redraft of the permanent program regulations, rhetoric aside, seems to be a genuine belief that the root problem of surface mining in the past has been a lack of technical expertise or accessibility to information regarding construction and design. This misassumption undergirds the vague approach which OSM seems to be embarking on, and is an exercise in regulatory futility.

First, the problems of surface mining abuses are not functions of lack of information. The reason that, historically, the best state-of-the-art technology was not applied to reclamation of surface mining operations is that to do so was not economically profitable, nor was it being demanded by an agency with power to enforce the demand. The industry is not primarily concerned with achieving optimal post-mining land configurations, since the main interest is the extraction, processing and sale of coal as cheaply as possible, for the maximum profit. It seems a bit foolish to have to state this, but the assumption that the industry is willing to do the best job possible "if only we show them how" is an approach far afield of mining realities.

The second problem is that the Office misplaces its reliance on the professional engineer to design and create "much more innovative designs." The testimony elicited from the public hearings held on the proposed Kentucky Round II submittal, in Frankfort, Kentucky on July 30, and in Pikeville, Kentucky on August 4, 1981, from representatives of the Kentucky Society of Professional Engineers, and Summit Engineering representatives contained two messages: (1) the engineers favored relaxing the design criteria to allow for more site-specific flexibility, but (2) that they disagreed with the requirements of certification of the design and construction of fills, impoundments, etc., and did not feel competent to do so.

The rationale given by a representative of the PEM section and the counsel for the Kentucky Society of Professional Engineers for the reluctance of the engineering profession to certify the design and construction was that they did not control the actual construction on-site, and could not vouch that the operator would follow their plans. It was stated that the only way to guarantee the end product would be to have the engineer on the site at all times that such construction was occurring; an approach which would be prohibitive in cost and unrealistic in terms of available engineers.

The clear thrust of this marked reluctance to certify the end product on the mine site is that the operator will not always do what is safe, optimal, and innovative. The use of good reclamation practice as a matter of course by the operator is not a sure enough bet for the engineering profession to stake its professional reputation on, and should not be the tenet upon which an entire regulatory program rests. The Office intends to abdicate oversight for design criteria and construction to a profession which will accept the flexibility, but not the responsibility.

As a footnote, the commenter does not mean to infer that engineers cannot be trusted to design a proper fill, etc., if left to do so with no more direction than the performance goals to be met. The reluctance of the professional engineer, as well as the author of these comments, lies in the unwillingness or inability of the operator/permittee to act in a manner consistent with the mandate of PL 95-87 and the best reclamation technology available for the particular site. The inability of the industry to effectively minimize its off-site impacts on air, water, land and human resources in a "voluntary" manner necessitated the passage of the Surface Mining Control and Reclamation Act of 1977.

The third aspect of the problem which militates against the wholesale deletion of design criteria from the permanent program regulations is the limitations of inspection and enforcement. In a setting where the regulations will be no more than a dark shadow of the Act's language, and great discretion will lie with the engineer to design a configuration which will meet that standard, it is not practical nor realistic to expect a reclamation engineer to have the capability to assess the operator's final product against (a) the design of the professional engineer or (b) the performance standard itself. The net result of this equation is that the "effectiveness" of the state program or federal counterpart in meeting the mandate of PL 95-87, and in a smaller frame, the compliance of each design in meeting a given performance standard, will be tested in floods, failing sediment ponds, increased siltation from poorly constructed or covered roads, etc. Assuming that a given design were not in compliance, and that the inspector had the engineering acumen to discern this and issue a notice of noncompliance, each assumed violation would result in prolonged litigation among expert witnesses over the probable success of various design configurations. Such a result is not that intended by the Act, and is unacceptable in meeting the goal of environmental protection through a program enforcing the performance standards uniformly throughout the coal regions.

CONCLUSION

Within the next few weeks, specific comment will be tendered covering the various rulemakings referenced at the beginning of these comments, to wit: Disposal of Excess Spoil and Underground Development Waste, Roads, Use of Explosives, Auger Mining, Permanent and Temporary Impoundments, Hydrology, and Coal Processing Waste. At this point, the most important comment to be made is that the reliance on the professional engineer reflected in these regulatory proposals is misplaced. The proposed redrafts, if they are indeed seeking flexibility, should incorporate alternative design criteria within the regulation, allowing for options towards meeting performance goals which are flexible, yet enforceable. The current approach leaves the regulations a mere shell, in derogation of the clear intent of Congress in enacting the substantive performance goals of Section 515 et. al. The pertinent legislative history is reproduced, at some length, in order that those responsible for drafting the above-referenced rules become aware that the skeletal approach currently embarked upon will not sufficiently meet the expectations of Congress nor the citizenry who struggled for the enactment of a enforceable law for over a decade.

The House Report on PL 95-87, H.Rep. 95-218, states with regard to the question of flexibility and specificity:

> Another element of flexibility is the avoidance of excessive detail in the requirements of the Federal performance standards. The committee is aware, however, of the history of the development of State laws on the subject of regulation of coal surface mining. This history presents a pattern of increasingly detailed legislation and such detail is often traceable to regulations which have failed to provide full implementation of the more general performance standards of the legislation itself. The committee believes that it has struck a balance between legislation which merely frames performance standards in terms of general objectives and standards which are cast in terms more detailed than those generally found in regulatory legislation. In choosing a middle path, the committee is mindful of the past failures on the State level and thus bases it (sic) approval of H.R. 2 on the expectation that Federal regulations promulgated under the act will fully implement the environmental performance standards. Obviously, the mere reproduction of the statutory environmental performance standards in the regulations would be inadequate. [Emphasis supplied].

The proposed regulations amount to little more than echoings of the performance goals of the Act, and hence are legally inadequate. More crucially, they are environmentally inadequate, since they hinge on increased reliance on a profession which wants freedom without responsibility in the area of surface mining design, and an industry which historically lacks the concern and will to do more to minimize environmental degradation associated with mining than is demanded of it through a strong inspection and enforcement program. The existence of technical handbooks with the latest state-of-the-art innovative designs changes nothing, unless the alternative designs are set out in enforceable regulation form, so that: (a) the citizenry has a degree of environmental protection assured in every operation; (b) the engineer need not assume the responsibility for inadequate design, since the standard of conduct in designs would be established by law and rule, and (c) the inspector would have a handle on enforcing the design criteria (whichever of alternatives would be adopted by the site) and the final performance standard.

The basic premise of this compilation of regulatory drafts, and all others which rely on deletion of design criteria, is fatally flawed and must be substantially altered.

Respectfully submitted,

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COMMENTS OF THE APPALACHIAN RESEARCH AND DEFENSE FUND OF KENTUCKY ON THE DRAFT ENFORCEMENT AND INSPECTION RULES

MAY 19, 1981

FUNDED BY THE LEGAL SERVICES CORPORATION

The comments are tendered by Thomas FitzGerald, Staff Attorney for the Appalachian Research and Defense Fund of Kentucky, Inc., on behalf of ARDF clients in the Kentucky coalfields who have suffered from abusive coal extraction processes in their lives. These comments are tendered in the hope that the drafters of these proposed rules will not allow "regulatory reform" to be used as a license for the operator to return to the all-too-recent days of abusive surface mining, and for the states to again become quiescent in their nonregulation of surface mining impacts.

The comments which follow will attempt to address individually the proposed changes in the inspection and enforcement regulations found at 30 CFR Part 840 and 842 - 843. Since there is a common thread of picking the body of the regulations bare, some of the comments which follow will address in more generic terms the problems with the proposed changes from a legal and factual basis.

Section 840.11 Inspections by State regulatory authority.

The regulation as proposed does a great injustice to the letter and intent of Section 517 of the Act. Section 517(h)(2) requires "the Secretary shall also, by regulation, establish procedures to insure that adequate and complete inspections are made." (emphasis added). The cumulative impact of the changes proposed for Section 840.11 will be to weaken the effectiveness of inspections, and to invite inadequacy and incompleteness in inspections, in a manner that is impermissible under the requirements of Section 517 of the Act.

The most glaring violation of Section 517 is in the deletion of the requirement that each partial, periodic, or complete inspection include the collection of evidence with respect to every violation found, and that the inspection report be adequate to enforce the requirements and to carry out the terms and purposes of the Act. The requirement of the collection of evidence is implicit in the terms of 517(h)(2).

To suggest that an adequate or complete inspection could be made without the collection of all pertinent evidence, so that the inspection would later translate into enforcement action to abate the violation or condition which is in derogation of the Act, is to subvert the core of the Act. It is obvious from the cynical attempt to redraft the rule that the drafters either have no knowledge of the practical aspects of surface mining and the problems of attempting to control the environmental effects of the industry, or have an understanding of the problems but lack the will to carry out the purposes of P.L.95-87.

The deletion of the requirement in 840.11(d)(1) that inspections occur on nights, weekends, and holidays, is again in derogation of Section 517(h)(2). The practice of wildcat or unpermitted surface mining operations operating on holidays, weekends, and at night, in order to avoid inspection and enforcement proceedings by the State, is one that is well-documented and needs no elaboration.

Another problem, on permitted operations, is that many will rely on the fact that inspectors will not inspect at night or on weekends, and release black water into streams, or blast at impermissible levels. If inspections conducted under an approved state program are to be effective, they must include night and weekend inspections, where such operations are occurring, and must additionally include prompt filing of reports which completely document the violations and hazardous conditions on each site. The proposed regulations under Section 840.11 are merely a caricature of the intent of Section 517 of the Act and are wholly unacceptable.

840.13 Enforcement.

The proposed deletion in (a) of the requirement sistency with 30 CFR Part 845 of the state civil and criminal penalty provisions, violates Section 503(a)(7) of the Act. The proposed revisions of 840.13(b)(c) are also in derogation of Section 503(a)(7) of the Act, and threaten the uniform nature of the procedural and substantive requirements of Sections 518 and 521 of the Act.

840.14 Availability of Record.

The deletion of the requirement that the state regulatory authority make available to the Director and the Regional Director copies of all documents relating to coal exploration and surface mining permits, as well as all documents relating to inspection and enforcement action, is inexplicable, and will prevent the Secretary from carrying out the obligation to monitor the state program for compliance and to institute a federal program where the state is failing to implement, enforce or maintain its approved state program under Section 504(a)(3) of the Act. Although it is apparent that the Office of Surface Mining does not view the over-sight role very seriously, which is also reflected in the suggestion that fly-overs be used to monitor compliance of the state program, there are nevertheless oversight responsibilities that are mandated under the Act which cannot be dissipated by regulatory fiat.

840.15 Public Participation

The proposed deletion of the requirement that each state provide for public participation in enforcement consistent with 30 CFR 842, 843 and 845 as well as 43 CFR 4, strikes at the heart of the federal Surface Mining Act, and is perhaps the most obvious attempt to undo the Act by regulation attempted by the current Administration thus far.

The 95th Congress, in passing P.L. 95-87, recognized that the active citizen involvement in all phases of the regulatory process would help to insure the effectiveness of the regulatory program. S. rep. 95-128, 95th Cong., 1st Sess. 59 (1977). This Congressional intent was reflected again in Section 102 of the Act at (i) where it is stated that a purpose of the Act is to:

> Assure that appropriate procedures are provided for the public participation in the development, revision, and enforcement of regulations, standards, reclamation plans, or programs established by the Secretary or any State under this Act . . . (emphasis added)

The legislative history reflected in both the Senate Report and the House Report of the 95th Congress, as well as the explicit requirements of Section 521(a)(1), 517(h)(1)(2), 520(d)(f) and 525 of the Act, mandate active participation in many substantive areas of enforcement. Further, 503(a)(7) requires State programs to contain rules and regulations consistent with Federal regulations. In recognition of this, the Office of Surface Mining added Section 840.15 to make clear that a state program had to meet the minimum criteria in enforcement which set out in various sections of the Act. The drafters of 840.15 brought together these requirements in one section so that the State might be aware that these were the minimum criteria required by Congress in the various sections of the Act for state program approval.

The deletion of Section 840.15 in its entirety attempts to relieve the State program of the requirement of providing for public participation in enforcement consistent with Part 842. The legislative history reflects graphically that with respect to public participation, an approved State program is to closely parallel the Federal scheme in access to the Courts, costs and expenses, rights to formal and informal review, the right to request an inspection and accompany the inspector and resulting inspections, and other procedural rights afforded on the Federal level. The rationale which underlay the Congressional requirement of active citizen participation in the approved State program, "to insure that the old patterns of minimal enforcement are not repeated," rings more true today then it did in 1977 when Congress passed this bill. Since it is obvious that the Federal Government has neither the funding nor the desire to meet their oversight responsibilities under the Act, the increased involvement of the private sector citizen in day-to-day enforcement of the Act and its performance standards, will be the only mechanism for carrying out the Congressional intent.

The deletion of 840.15 is ill-advised and should be reconsidered.

842.11 Federal Inspections.

The proposed change in 842.11 (a) to require monitoring and inspection of operations jointly with the State regulatory authority is an idea that threatens to undermine the purpose of Federal inspections and monitoring on non-federal lands, which is to evaluate the administration of an approved State program with an eye towards the implementation of a Federal program when a State program is dysfunctional. To monitor jointly with the State under such circumstances is akin to prior notice of an inspection to a permittee, and defeats the purpose of monitoring.

The changes to 842.11(b) serve only to confuse the various circumstances under which a federal inspection will occur, and the original language should be replaced so as to set forth the various requirements of Section 521 of the Act on both the Federal and State regulatory authority. Proposed (a)(4) confuses the standards for imminent danger or harm inspections by combining them; potentially increasing the standard for requesting an inspection impermissably.

The deletion at 842.11, as well as the deletion throughout inspection and enforcement regulations of reference to coal exploration operations is patently illegal and must be remedied. The Act makes it clear that coal exploration operations are to be included within the purview of operations under the Act.

The deletion of the language at 842.11(c)(1), (2) and (3) which defined a partial complete and periodic inspection and require the collection of evidence with respect to every violation of conditions of expiration, approvals and permits, again puts the regulatory authority on notice that OSM does not intend to look very closely at the quality of the inspections being conducted by the State regulatory authority. It is axiomatic that an effective inspection,and effective enforcement flowing from that inspection,hinges on the proper and complete collection of evidence with respect to all violations, followed by stringent, speedy, evenhanded and efficient enforcement of the Acts requirement. The relaxation of requirements dealing with collection of evidence, is an invitation to non-enforcement and to the failure of any state program and is violative of Section 517 of the Act.

842.12 Citizens' Requests for Federal Inspections.

The proposed change in 842.12(a), which states that a citizen may request a federal inspection where there is reason to believe that a violation, condition or practice "prescribed (sic) by the Act" exists, serves no purpose other than to raise the question of whether the violation of a state program, permit condition, or exploration approval, would be actionable once a state program were approved. The obvious answer to this is that such a violation of a permit condition or a state program which was granted approval under the Act would necessarily violate the provisions of the Act, and hence be actionable.

The proposed rule deletes the definition of "reason to believe" found at 842.11(b)(2). This provision states that if a fact alleged in a citizens complaint, if true, would consitute a violation, condition or practice, or imminent danger to safety or the environment, there must be an inspection. This standard is a fair one, which balances the need to protect the public as well as that of protecting the permittee from harassment, and should be retained. To leave such a phrase undefined is to invite needless and senseless litigation, which would be burdensome and counterproductive.

The draft regulation at 842.12(e) deletes the requirement that the name of the citizen who provides information leading to an inspection and enforcement action be deleted when such information is given to the permittee. Such a protection is essential, and to remove such a requirement, except insofar as the disclosure is required under the Freedom of Information Act (5 USC Section 522) or other federal law, is to invite the industry to act in an vindictive and retributory way toward the individual who is seeking to assert their statutory right to complain about a violation which they believe exists and to carry out the Congressional intent of adequate enforcement of the Act.

842.13 Right of Entry.

The proposed rule is deficient in its deletion of the phrase "this Chapter, the applicable program or any condition of an exploration approval imposed under the Act, this Chapter or the applicable program." The deletion of a requirement of consistency on the part of the Office of Surface Mining employees, permittees and state programs with the requirement not only of the Act but also of federal regulations promulgated pursuant to the Act, and conditions imposed via permit or exploration approval pursuant to the regulations by the state or federal regulatory authority, does violence to the plain language of Section 503(a)(7) of the Act, and does further violence to the authority of the Office of Surface Mining. I am hard pressed to understand why the Office of Surface Mining would seek to hamstring the authority given it by Congress by adopting such a narrow interpretation of its own authority. Such an interpretation as this would prevent them from, in this case and in many other cases where similar language has been deleted in these draft rules, effectively carrying out their responsibilities by foreclosing their ability to demand compliance with their own regulations. The authority of the Secretary to promulgate such regulations has been upheld by both the District Court and Court of Appeals for the District of Columbia. One can only assume that the Office seeks to relieve permittees of their obligations to comply with specific mandates, seeking instead only lip service to vague and unenforceable statutory standards. This is an improperly restrictive view of the requirements of the Act.

842.14 Review of adequacy and completeness of inspection.

It is ironic that the drafters of these proposed rules left this section intact, since they have effectively removed all of the prerequisites to an adequate or complete inspection from their draft regulations. Specifically, the draft rule can no longer use 30 CFR 842.11(b)(1)(i), (c) and (d) as benchmarks for determining the adequacy and completness of an inspection, since they have surgically removed the vitals of those sections i.e., the requirement of the collection of evidence, the requirement of night, weekend, and holiday inspections, and requirement that inspection reports the adequate to enforce the requirement in terms of permits, and conditions on exploration approval, as well as regulations promulgated pursuant to the Act. Having gutted the requirements of a federal and state inspection in this fashion, the process of reviewing an inspection for adequacy and completeness becomes a charade. The deletion of these requirements under 842.11, and of the requirement that the inspection include the collection of evidence of all violations, is an affront to the Act.

The inclusion of provision for extending the fifteen (15) day for consideration of the citizen request for review of adequacy and completeness of an inspection is a frivolous, unnecessary provision. Its inclusion there seems indicative of the drafters intent to provide a loophole for every seemingly iron-clad deadline set out by Congress.

842.16 Availability of records.

This regulation is inconsistent with the requirements of the Act insofar as it does not make available to the permittee and to the public copies of records, reports, etc., relating to federal land programs. The deletion of this from the current 842.16 is hopefully, simply a matter of oversight.

843.11 Cessation Orders.

First, the drafters are to be commended for not tampering with the conditions under which a cessation order is to be issued. However, the deletion of the phrase "and may require, among other things, the use of existing or additional personnel or equipment," restricts the ability of the field inspector to create affirmative obligations which maximize the economic utility of existing resources, in order that the most expeditious abatement of the violation, condition or practice physically possible might occur, while at the same time not idling the workforce of the permittee.

The deletion of existing section 843.11(d) is counterproductive and threatens to undermine the intent and goals of the Act. Recently, the Secretary proposed a revision of the 90 day abatement, citing as a rationale for this illegal extension, the concept that requiring abatement might cause more environmental harm than good in some select circumstances. Here, however, we find the drafters deleting a provision that requires reclamation operations and other activities intended to protect public health and safety and the environment continue during a period where a cessation order is in effect. The deletion of this remedial clause does injustice to the intent of the cessation order and to the spirit and intent of the Act. The provision should be reinstated.

843.12 Notices of Violation.

The attempted creation of an extension of the 90 day abatement period set forth in Section 521(a)(3) of the Act is illegal and must be deleted. Since the promulgation of the interim Surface Mining Regulations on December 13, 1977, at the Office of Surface Mining has consistently taken the position that 521(a)(3) of the Act prohibits the setting of an abatement time, initially or as extended, beyond 90 days. The proposal that the time be extended to 180 days, or that the 90 days be tolled when labor disputes, unavailability of equipment, acts of God or other acts of force majure might occur is not new, and is no more legal four years later than it was in 1977. The clear language of 521(a)(3) of the Act, as well as the legislative history,* clearly states that while inspectors may extend the initial abatement period, the total period cannot exceed 90 days.

The proposed 843.12(c), (f), (g), and (h) must be struck in their entirety. Irregardless of the purportedly stringent restrictions on the availability of such an extension, the extension is illegal, and invites subterfuge.

The proposed 843.12(e) is not only illegal, but is laughable. The suggestion that a notice of violation may be terminated upon a finding of compliance that is based on a signed statement from a permittee that the violation has been abated is either incredibly cynical or ignorant, or a combination of the two. Possibly the drafters would go a step further and replace the inspection force on both the federal and state level with a staff of bureaucrats based in Washington who mail and process written inspection reports that are sent to voluntarily listed permittees who assess their own operation's compliance with the Act, suggest penalties which they feel are fair, and further issue cessation orders to themselves and then abate them. The proposed addition is an insult to every citizen who has been involved in the promulgation of these regulations, and calls into question the intent and integrity of this entire rulemaking process. This rule should be stricken and an apology should issue for its having been included as a draft rule.

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*See: House Rep. 95-218, at 130 (1977), wherein it states: The inspector can extend this initial period for up to 90 days. If the violation has not been corrected within the established time, the inspector must immediately order a cessation of the mining . . . .

843.13 Suspension or revocation of permits.

The deletion of the phrase "exists or has existed and that the violations were caused by the permittee" from the description of when a show cause order will be issued regarding suspension or revocation of the permit is confusing and unnecessary. Section 521(a)(4) provides specifically that the Secretary may suspend or revoke a permit after hearing based on violations of the Act or of permit conditions which exist or have existed.

The deletion of the definition of "willful violation" and of "unwarranted failure to comply" from 843.13 does nothing but cause confusion to the permittee as to what standards of conduct are expected of him or her. The phrase "unwarranted failure to comply" is taken directly from the statutory definition of the phrase found at Section 701(29); and the phrase "willful violation" was arrived at through a careful process of commenting and clarification. No legitimate purpose is served by the deletion of these definitions.

The draft rule is deficient also in the deletion from Sections(a),(2),(3) and (4) of the requirement for mandatory revocation show cause orders. The current regulation fleshes out the mandate of Section 521(a)(4) of the Act, by clarifying what is and is not considered in arriving at a "pattern of violations." These provide guidance both to the regulatory authority, the state in its drafting of a program, and to the permittee, and should be retained.

The deletion of the requirement of (c)(2) that notice of the show cause order be posted at the regional, district or field office closest to the area of the operation, and further that a newspaper notice be printed along with information regarding intervention, is not in keeping with the letter and intent of the Act. The Act is replete with suggestions that active citizen involvement in the regulatory process, including the administrative process, is key to effective surface mining enforcement. Unless public notice is given in a manner that is designed to be effective, there will be few intervenors to be sent notice under proposed Section (c). The presence of intervenors in this process at a meaningful juncture will assure that all the information regarding the history of the coal company is brought out, and that a decision regarding revocation or suspension of the permit is a rational one, based on all of the known facts. Existing (c)(2) and (3) should be retained.

843.16 Formal review of citations.

The draft regulation improperly deletes the provision which states that the filing of an application for review and request for hearing shall not operate as a stay of any notice or order. The deletion of this subsection will merely be confusing to the permittee, since it is clear from the language of Section 525(a)(1) of the Act that "the filing of an application for review under this subsection shall not operate as a stay of any order or notice." The deletion is illegal and the prior section should be restored.

843.17 Failure to give notice and lack of information.

The deletion of this rule is ill-advised, and threatens to undermine the enforcement scheme set out in the surface mining act. The purpose of the section is to make clear that the failure of OSM to provide ten-day notification, or the later discovery that sufficient belief or reasonable grounds did not exist for the inspection, has no effect on substantive notices of violation or cessation orders issued pursuant to such investigations. The ten-day notification is a matter of comity between the federal and state regulatory authorities and in no way effects the ability of the permittee to avoid a violation that has been issued. The fact that there may be situations where a ten-day notice is not technically complied with prior to a federal investigation is not envisioned by the Act as providing a ground for vacating such a violation. Mere lack of compliance with the ten-day notification would not render such violation or cessation order void ab initio. Similarly, though there may not have been sufficient grounds to justify the inspection at the onset, the existence of a violation on the site, or an imminent hazard, is conclusive proof that the inspection was not frivolous. The provision should not be deleted, since to so would give rise to the inference that substantive violations may be challenged on these technical grounds and later vacated.

843.18 Inability to comply.

The deletion of the rule regarding the use of inability to comply as a defense to a notice of violation or cessation order is illadvised and illegal. It is clear from the legislative history and the structure of the Act that the inspector has the authority to shut down operations and also to require affirmative obligations to abate the violation. The cessation order is to be terminated upon abatement, or where modified, vacated, or terminated by the regulatory authority. There is sufficient flexibility within this section to allow the permittee and field inspector, during informal hearing or a more formal administrative proceeding to apply the best state of the art technology to repair the site in the most expeditious manner physically possible. Inability to comply is not a defense, although it can be utilized to mitigate the amount of civil penalty. The provisions dealing with "unwarranted failure to comply" in Section 701(29) of the Act, and Section 518 of the Act, provide sufficient flexibility so that the permittee who has done everything physically possible to correct or abate a violation which he has created, will be dealt with differently than one who has not acted with reasonable care, and all due haste to abate such violations.

It is clear that the Act provides a certain amount of time to accomplish remedial measures and no more. The drafters of the Act left sufficient leeway within the penalty provision for dealing with truly unique situations of inability to comply in the assessment phase. There is no place for it in the NOV or cessation order issuance phase.

CONCLUSION

The proposed draft enforcement and inspection rules which have been offered by OSM operate on a number of shaky assumptions. The first and most obvious of these misassumptions is that the agency has no limits imposed either by the Act, legislative history, or judicial decisions which have been reached, upon its ability to redefine the regulation of strip mining by rulemaking.

The second, and more serious of the assumptions that the agency is making is that the basic thread and operative premise of the Act, i.e., that the states were unwilling and incapable of regulating surface mining adequately and *therefore* a federal program establishing uniform minimum standards was necessary, is no longer valid. The agency is sorely misstaken in this, and it will be the people of the coalfields who will most directly feel the full effect of the naiveté of such a belief.

In a larger sense, the nation will suffer from the weakening of the Act, in the pollution of our navigable waters, the continued bust- boom cycle of regions dependent on coal for their livelihood, and in the degredation of productive crop and timberland. The drafters of these rules should be very careful lest they loose devastating forces which could lay waste to whole regions of our country and tarnish its natural fertility and beauty for generations to come.

Respectfully submitted,

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COMMENTS OF CITIZEN TASK FORCE ON PRIMACY ON THE PROPOSED KENTUCKY PERMANENT PROGRAM FOR REGULATION OF SURFACE MINING

The comments which follow are tendered by Hon. Thomas FitzGerald, Staff Attorney for the Appalachian Research and Defense Fund of Kentucky, Inc., as representative of the citizens and environmental interests on the Primacy Task Force established by Secretary Swigart to review the Kentucky program. These comments are endorsed by the Kentucky Conservation Committee.

INTRODUCTION

The Department for Natural Resources and Environmental Protection has travelled a good distance towards implementing a program for the regulation of the surface effects of mining within the Commonwealth. The most recent proposal represents a good faith effort at meeting the minimum criteria required by 30 USC §1201 in order to assume primary regulatory responsibility; a showing of good faith that has hitherto been lacking. The citizens task force supports the inclusion of many public participation criteria into the package, and tenders

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these comments on deficiencies in the current proposal in the spirit of attempting to make the program consistent with the mandate of the Surface Mining Control and Reclamation Act of 1977.

As a final preface, the citizenry of the eastern Kentucky coalfields are aware of the move afoot to weaken the Act and regulations promulgated pursuant to the mandate of the Act. The current status of the Kentucky package represenats long and diligent oversight by citizens and for many, over a decade of struggle for environmental protection. We will continue to work to assure that the state and federal programs are consistent with the mandate of Congress, and will forcefully resist all efforts to dilute and nullify the federal and state programs.

THE "STATE WINDOW" ISSUE

The question of consistency in form and substance between the state and federal programs has been a matter of great concern with the industry since the passage of the Act in 1977. Under the guise of a "Kentucky program for Kentucky coal," or under a banner of federalism, proponents of a weak state program have attempted to distort the intent of the so-called "state window" to create unacceptably weak state counterparts to the federal requirements.

The issue of the applicable standard of similarity between state and federal programs has been joined by the proposed rulemaking of the Office of Surface Mining on 30

CFR 730.5, 731.13 and 732.15. OSM proposes to replace the current standards of "consistent with" and "in accordance with" with a nebulous standard requiring only that the state regulations be "as effective as" the federal regulations in meeting the mandate of P.L. 95-87.

This comment is included in the citizens comment package by way of informing the State of our position on this issue, and by way of advising the state that a hasty leap into the quagmire of "effectiveness" is ill-advised. The new rule, if promulgated, will be challenged forcefully. Until the issue is resolved, the state should not rush to follow the Office of Surface Mining down a dangerous path. What follows is excerpted from comments submitted to OSM on proposed rules amending 30 CFR 730.5, 731.13 and 732.15:

The Act sets out a unified standard of similarity for approval of a State program. It is impermissible to assume that only the state law must closely resemble its federal counterpart, and that the regulations may vary widely from the federal regulations so long as they are as effective with regards to the Act.

Leaving aside, for the moment, the impossibility of enforcing the "effectiveness" standard, and the incredible abuse which will certainly follow under state programs approved under the proposed rule, the proposal creates two standards for approval where only one exists. If the use of the term "in accordance with" to describe the degree of similarity required between the federal law and approvable state law in Sec. 503(a)(1) and the use of "consistent with" in Sec. 503(a)(7) to describe the requirement of similarity between the Secretary's regulations and those of the state, rather than one phrase for both situations is, in retrospect, seemingly ambiguous, it is not the foundation for different levels of scrutiny of the state program components.

Throughout the Act and legislative history it is clear that the current approach of 30 CFR 730.5, which utilizes one definition for both phrases, was the approach envisioned by Congress, and that the one standard mandates substantial similarity in form and content unless local conditions (physical, not political) require state alternatives.

The proposed rule retains the language of present 30 CFR 730.5(a) which defines "in accordance with" and "consistent with" to mean, with regards to the Act, that:

> The state laws and regulations are no less stringent than, meet the minimum requirements of and include all applicable provisions of the Act.

The proposed rule then posits that the same phrase, applied to the regulations, only requires comparable "effectiveness" of the state regulations with those of the Secretary when judged against the Act, rather than the consistency of the two sets of regulations when adjudged against each other, as required by Sec. 503(a)(7). This analysis is grounded in a misassumption that there is a lesser standard where the regulations are concerned. The use of "accord" and "consistent with" to cover both the laws and regulations, by Congress, belies that interpretation.

Section 701(25) of the Act defines a "State program" to be one:

> [E]stablished by a State pursuant to Section 503 to regulate surface coal mining and reclamation operation on lands within such State in accord with the requirements of this Act and regulations issued by the Secretary pursuant to this Act. [Emphasis supplied]

The definition clearly supposes the existence of one standard for approval of both the state law and regulation, consistent with the underlying principle of the Act that uniform national minimum standards for surface mining be met by all states wishing to assume primary regulatory responsibility. Secs. 101(g), 102(a), 201(c)(9), 503(a)(1)-(7).

The recent decision in Hodel v. Virginia Surface Mining and Reclamation Ass'n., _____US_____,No. 79-1538 (June 15, 1981), further supports the interpretation that the state must provide laws and regulations consistent with those of the Act and Secretary.

> Under Sec. 503, any State wishing to assume permanent regulatory authority over the surface coal mining operations on 'non-Federal lands' within its borders must submit a proposed permanent program to the Secretary for his approval. The proposed program must demonstrate that the state legislature has enacted laws implementing the environmental protection standards established by the Act and accompanying regulations, and that the State has the administrative and technical ability to enforce these standards. 20 USC 1253. [Emphasis supplied.]

Hodel, at ____.

The language of the Hodel decision demands that the state must develop a program implementing the federal regulations, not "approaching," "approximating", or being "as effective" in meeting the requirements of the Act. The Surface Mining Control and Reclamation Act of 1977 was not passed as a model statute--it is intended to establish a national set of minimum standards to be met or exceeded.

The Conference Report of H.R. 2, The Surface Mining Control and Reclamation Act of 1977, (H.Rep. 95-218, 95th Cong. 1st Sess.) erases any doubt that there is but one standard for approval, and that the state needs to provide a regulatory approach consistent with that of the Secretary, where it states:

> The conferees agreed to clarify the language of the bill dealing with the consistency of state laws and regulations with the Federal laws and the Secretary's regulations. They adopted the principle of the Senate amendment that an approved state program requires (a) a State law consistent with the Federal law and (b) state rules and regulations consistent with the the Secretary's regulations. The Conference Report retains the basic principle that the Federal law and regulations are minimum standards which may be exceeded by the States.

Id at 102.

There remains no doubt that there is but one uniform criteria to be applied in gauging an approvable state program; that it is no less stringent than (though it may be more so), and meet all the applicable requirements of the Act and the Secretary's regulations. The standard is one of consistency in form and substance throughout, not of "effectiveness" as to the regulations.

A "State window" provision is a useless appendage to a rule which cuts the mooring of the state programs and allows them to drift far afield of the Act without rudder or compass.

Congress spoke to an issue which had been ill-addressed by the states for years; the statutory program was designed to "establish a nationwide program**" to control effects of surface mining, because of the failure of the states to do so due to various political and economic pressures.+ The proposed elimination of the 30 CFR 731.13 requirement that the state program alternatives be justified by local needs violates the mandate of Sections 503(a)(1) and (7), and of Section 201(c)(9). Against a backdrop of national performance standards and procedures for surface mining operations, Congress recognized that the physiographic differences among the coal regions would necessitate a certain degree of flexibility in approach for enforcement of some substantive performance standards. This is reflected in Sec. 201(c)(9) of the Act, which authorizes the Secretary to:

> assist the States in the development of State programs for surface coal mining and reclamation operations which meet the requirements of the Act, and at the same time, reflect local requirements and local environmental and agricultural conditions . . . .

The implication of this grant of authority is that the Secretary was to assure first that the state program meet the Sec. 503 mandate, and then that consistent with 503, certain alternative approaches justified by local requirements and conditions could be entertained. Current 30 CFR 731.13 directly addresses that need for flexibility, as Congress intended.

** 30 USC 1202(a)

+ 101(g)

The proposed opening of the state window will undermine the foundation upon which the entire regulatory scheme of PL 95-87 rests.

SYSTEMS ANALYSIS

The first comment pertains to the field issuance of cessation orders upon the finding of an imminent danger or a failure to abate a notice of violation/noncompliance.

The proposed program is inconsistent with the requirement of the Act that field issuance of cessation orders is a power which must be wielded immediately upon finding an imminent danger, by inspectors in the field. The proposed program suggests that the power will be wielded by only some inspectors under the Kentucky program. The program proposal, at 731.14(g)(4-7)(15) in the narrative, states that:

> All inspectors can write Notices of Noncompliance. All principal reclamation inspectors are delegated authority to write Orders for Cessation and Immediate Compliance.

This is inconsistent with Sections 518 and 521 of the Act, which establish the basic standards for state program approval in the enforcement provisions, requiring that a state include enforcement sanctions that are "at least as stringent" and utilizing procedural requirements which are the "same or similar."

Federal law requires the field issuance of sanctions, and with good reason. 44 Fed. Reg. 14963, 15295 (March 13, 1979). As stated by both Houses of Congress:

> By mandating primary enforcement authority to field inspectors, this bill recognizes . . . that inspec-

> tors are in the best position to recognize and control compliance problems.

S.Rep. No. 95-128 at 90, H.Rep. No.95-218 at 129, 95th Cong. 1st. Sess. (1977).

The proposed Kentucky program suggests that it will carry out the mandate of cessation for failure to abate and for imminent danger situations by delegating the power to order immediate cessation to those individuals who have attained the level of "Principal Reclamation Inspector" or higher. The proposed scenario will rely on radio contact and ready availability of principal and chief inspectors who will be "dispatched" once a field inspector discovers an imminent danger situation.

The proposal is fatally flawed. First, the state is suggesting that the field inspector without two or three years experience can detect and discern when an imminent danger exists (since calling a principal inspector hinges on detecting the danger) but that the "novice" cannot write up the violation. If the inspector is capable of exercising judgment in determining the existence of the danger, citing it is a ministerial act which should pose no problem. If the inspector cannot make that judgement call, the imminent danger will proceed unchecked, and the Act will be violated.

Secondly, imminent danger situations often occur as a result of physical events, i.e. storm events, etc., where the conditions in a mined area will occur chronically throughout the area. The availability of "experienced" inspectors, may be seriously curtailed, and the reponse time further slowed. At the public hearings, Mr. Adams of Operations and Enforcement stated that the response time would not exceed two hours. That sort of delay is unacceptable; the toll in life and limb, as well as irreparable property damage which can occur in that span, when balanced against potential or imagined errors of judgement in citing non-imminent dangers, leans strongly towards immediate action followed by a due process hearing, rather than a delay in a situation which can tolerate no delay.

The Departmental position has suggested that it does not have personnel in the field who are capable of enforcing this provision, which is at the core of the enforcement mechanisms of PL 95-87. The position suggests that the Department lacks personnel of the caliber or experience to do adequate field inspection and enforcement. The solution to this problem is to train all inspectors from the onset to deal with imminent danger situations as part of their training, and to constantly be improving conditions vis a vis private sector opportunities for inspectors.

The Department suggests that within two or three years, the entire regulatory force will be able to issue field orders. The program asks us to rely on two unknowns, the first of which is a belief that inspectors' salaries and conditions will continue to maintain pace with the private sector. The current decrease in attrition may not continue due to these factors. Secondly, the Department is suggesting that two or three years experience in the field will enable someone to discern imminent hazard situations. However, during that time, the inspector will gain no practical experience in the writing and closing down of operations, due to this restriction. On-the-job experience with reclamation inspection will not provide the imminent hazard situation experience suggested, which further supports the idea that the training should occur upon hiring, as part of the comprehensive package.

Assuming that the state does not correct this blatant violation of the Act, and presses its contention that it will be able to immediately order cessation under its new scheme, the Department should provide detailed information regarding the following:

--Ratio of inspectors of less than Principal status to those over such status;

--Gross number of inspectors, and by District Office, their tenure and position;

--Historic data regarding attrition, by position and District, within Operations and Enforcement;

--Demographic breakdown of number of inspectors and their position status and inspectable units of operation within each District;

as well as other statistical information that would enable both the affected citizenry and the Office of Surface Mining to make a rational decision on the effect of the proposed plan.

The second issue is that of legal staffing of the Office of General Counsel, and the hiring of hearing officers. The program document, at 731.14(e), 5.4., states that the Department is "in the process of hiring several more lawyers." We understand that there is a general freeze on hiring, and would like a clarification on how many attorneys will be hired, where they will be paid from, and whether they will be working solely on surface mining-related issues.

With regards to the hearing officers, the "preliminary hearing" process will require the retention of numerous individuals in the coalfields, as well as the hiring of hearing officers to conduct the formal hearings under the permanent program. We believe that the cost and logistics of this process have been handled in a rather summary fashion, and feel that the program narrative document should specifically address the problems of:

1. Conflict of interest provisions for local hearing officers;
2. Qualifications for local hearing officers;
3. Pay scale and funding source for local hearing officers;
4. Provisions for terminating services of local hearing officers.

Without such information, the practical functioning of such a process is a matter of speculation.

STATUTORY ISSUES

I. The first issue concerns the scope of the state counterpart to Section 520 of the Act, KRS 350.250. The state has responded to the finding of Secretary Andrus that the language "any citizen of the Commonwealth" restricted access to the Courts of Kentucky in a manner inconsistent with 520(a), by stating that the language means anyone, not just citizens. The legislative debate before both House and Senate subcommittees of the Kentucky General Assembly clearly reflected an intent to exclude non-residents from bringing such actions. The potential chilling effect of this provision renders it unacceptable and inconsistent. We reaffirm the position taken by OSM and Secretary Andrus in the first round decision.

II. The Department may be correct in its analysis that 350.250 provides a damage action consistent with Sec. 520(f) of the Act, without specifying such. However, the damages action is not one grounded in common law, and protected by such provisions as Sec. 14 of the Ky. Constitution--it is an action which provides for relief for damages flowing from a violation of a statutory scheme for environmental protection. The rights created and causes of action to assert them, are new and unique, as are the standards of conduct for the industry.

The creation of a cause of action for damages flowing from violations of the Act and regulations must be specifically provided for, in order that there be no doubt of the intent of the legislature and the availability of the action. The ambiguity currently existent impermissibly chills citizen access under the Act. The action for damages should be amended in the 1982 General Assembly to read consistent with Sec. 520.

REGULATORY ISSUES

1. The citizen task force supports the changes made in the definitional section, 7:010 which make the state program consistent with the federal Act regarding citizen participation, particularly the state responses under 12.2(g) and (f).

2. The provisions of 8:010 Sec. 8(8) pertaining to the local filing of a permit application, remain unchanged and unsatis-

factory. The requirement of 30 CFR 786.11(d)(2) is that:

> The applicant shall file the copy of the complete application under Paragraph (d) (1) of this Section by the first date of newspaper advertisement of the application. [Emphasis supplied]

Meaningful opportunity to comment on the location and scope of operations which will directly and drastically impact on communities, hinges on timely access to complete and accurate information regarding the proposed operation. The Kentucky proposal requires currently that:

(1) the applicant "make a full copy of the complete application . . . available," and that;

(2) the applicant publish notice for four weeks "as contemporaneously as possible" with the receipt of notice of completeness.

There is no requirement currently that the filing of a complete application must occur at or even near the same time as publishing notice of intention to mine. This is inconsistent with the clear language of 30 CFR 786.11(d)(2) and impermissibly curtails citizen access.

3. Proposed 7:090 has been substantially revised, but still lacks many of the essential elements of citizen participation which are required by PL 95-87 and accompanying regulations.

The first issue is that of discovery in administrative proceedings. The Department has not altered its position that it need not set out the rules of discovery in administrative hearings before the Department. It has curtailed the current substitute provision somewhat, by dropping "unless the parties otherwise agree," but still fails to provide the full gamut of discovery rights guaranteed by the federal Act and regulations.

The Department attempts to provide discovery rights by stating, at 7:090 Sec. 5(5)(a) that:

> The pertinent provisions of the Kentucky Rules of Civil Procedure shall apply to cases before the department, consistent with KRS Chapter 350 and these regulations.

This provision is a feeble attempt to include discovery rights. It fails to mention them at all, and does not spell out the timing of such rights, provisions for seeking subpoenas, and for enforcing lack of discovery or for seeking protective orders. The provision is pointless, as written, since it does not incorporate provisions of the Kentucky Rules of Civil Procedure, but only references them where "pertinent."

The Kentucky Rules of Civil Procedure, by their own language, are not pertinent nor applicable to administrative proceedings, without a clear statement by the agency adopting them. The Civil Rules, at Rule 1, "Title and Scope of Rules" states:

> These Rules govern procedure and practice in all actions of a civil nature in the Court of Justice . . . .

The Kentucky Constitution, Section 109, defines "Courts of Justice" in the following fashion:

> The judicial power of the Commonwealth shall be vested exclusively in one Court of Justice which shall be divided into a Supreme Court, a Court of Appeals, a trial court of general jurisdiction known as the circuit court and a trial court of limited jurisdiction known as the dis-

> trict court. The court shall constitute
> a unified judicial system for operation
> and administration. . . .

It is clear that administrative tribunals are outside of the scope of the Kentucky Rules of Civil Procedure, thus there are no pertinent provisions to be applied under 7:090.

The discovery rights must be incorporated specifically by the Department into their regulations, and stated to be applicable as rules governing discovery in administrative proceedings.

The citizens/environmental task force has consistently proposed a workable set of discovery rules, patterned upon those existing in the Office of Hearing and Appeals Regulations at 43 CFR 4.1130-1141. We propose again that they be adopted:

DISCOVERY

1. Parties may obtain discovery by one or more of the following methods:

   (a) Depositions upon oral examination or upon written interrogatories;

   (b) Written interrogatories;

   (c) Production of documents or things or permission to enter upon land or other property, for inspection and other purposes; and

   (d) Requests for admission.

2. Following the initiation of a proceeding, the parties may initiate discovery at any time as long as it does not interfere with the conduct of the hearing.

3. (a) Unless otherwsie limited by order of the hearing officer in accordance with these rules, the parties may obtain discovery regarding any matter, not privileged, which is relevant to the subject matter involved in the proceeding, including the existence, description, nature, custody, condition, and location of any books, documents, ot other tangible things and the identity and location of any persons having knowledge of any discoverable matter.

(b) It is not grounds for objecting that information sought will not be admissible at the hearing if the information sought appears reasonably calculated to lead to the discovery of admissible evidence.

(c) A party may obtain discovery of documents and tangible things otherwise discoverable under paragraph (a) of this section and prepared in anticipation of or for the hearing by or for another party's representative (including his attorney, consultant, surety, indemnitor, insurer or agent) only upon a showing that the party seeking discovery has substantial need for the materials in the preparation of his case and that he is unable without undue hardship to obtain the substantial equivalent of the materials by other means. In ordering discovery of such materials when the required showing has been made, the hearing officer shall protect against disclosure of the mental impressions, conclusions, opinions, or legal theories of an attorney or other representative of a party concerning the proceeding.

(d) Upon motion by a party or the person from whom discovery is sought, and for good cause shown, the hearing office may make an order which justice requries to protect a party or person from annoyance, embarassment, oppression or undue burden or expense, including one or more of the following:

(1) The discovery not be had;

(2) The discovery may be had only on specified terms and conditions, including a designation of the time or place;

(3) The discovery may be had only by a method of discovery other than that selected by the party seeking discovery;

(4) Certain matters not relevant may not be inquired into, or that the scope of discovery be limited to certain matters;

(5) Discovery be conducted with no one present except persons designated by the hearing officer, or

(6) A trade secret or other confidential research, development or other commercial information may not be disclosed or be disclosed only in a designated way.

4. Unless the hearing officer, upon motion, for the convenience of parties and witnesses and in the interests of justice, orders otherwise, methods of discovery may be used in any sequence and the fact that a party is conducting discovery, whether by deposition or otherwise, shall not operate to delay any other party's discovery.

5. A party who has responded to a request for discovery with a response that was complete when made is under no duty to supplement his response to include information thereafter acquired,

except as follows:

(a) A party is under a duty to supplement timely his response with respect to any question directly addressed to:

(1) The identity and location of persons having knowledge of discoverable matters; and

(2) The identity of each person expected to be called as an expert witness at the hearing, the subject matter on which he is expected to testify and the substance of his testimony.

(b) A party is under a duty to timely amend a prior response if he later obtains information upon the basis of which:

(1) He knows the response was incorrect when made, or

(2) He knows the response though correct when made is no longer true and the circumstances are such that a failure to amend the response is in substance a knowing concealment.

(c) A duty to supplement responses may be imposed by order of the hearing officer or agreement of the parties.

6.(a) If a deponent fails to answer a question propounded, or a party upon whom request is made pursuant to Subsection 11 or a party upon whom answers to interrogatories are served fails to adequately respond or objects to the request, or any part thereof, or fails to permit inspection as requested, the discovering party may move the hearing officer for an order compelling a response or inspection in accordance with the request.

(b) The motion shall set forth:

(1) The nature of the questions or request;

(2) The response or objection of the party upon whom

the request was served; and

(3) Arguments in support of the motion.

(c) For purposes of this section, an evasive answer or incomplete answer or response shall be treated as a failure to answer or respond.

(d) In ruling on a motion made pursuant to this section, the hearing officer may make such a protective order as he is authorized to make on a motion made pursuant to Subsection 3(d).

7. If a party or an officer, director, or other agent of a party fails to obey an order to provide or permit discovery, the hearing officer before whom the action is pending may make such orders in regard to the failure as are just, including but not limited to the following:

(a) An order that the matters sought to be discovered or any other designated facts shall be taken to be established for the purposes of the action in accordance with the claim of the party obtaining the order;

(b) An order refusing to allow the disobedient party to support or oppose designated claims or defenses, or prohibiting him from introducing designated matters into evidence; or

(c) An order striking out pleadings or parts thereof, or staying further proceedings until the order is obeyed, or dismissing the action or proceeding or any part thereof, or rendering a judgment by default against the disobedient party.

8(a) Any party desiring to take the testimony of any other party or other person by deposition upon oral examination or written questions shall, without leave of the hearing officer, give reasonable notice in writing to every other party, to the person to be examined and to the hearing officer of:

(1) The proposed time and place of taking the deposition,

(2) The name and address of each person to be examined, if known, or if the name is not known, a general description sufficient to identify him or the particular group or class to which he belongs;

(3) The matter upon which each person will be examined; and

(4) The name or descriptive title and address of the officer before whom the deposition is to be taken.

(b) A deposition may be taken before any officer authorized to administer oaths by the laws of the Commonwealth of Kentucky.

(c) The actual taking of the deposition shall proceed as follows:

(1) The deposition shall be on the record;

(2) The officer before whom the deposition is to be taken shall put the witness under oath or affirmation;

(3) Examination and cross-examination shall proceed as at a hearing;

(4) All objections made at the time of the examination shall be noted by the officer upon the deposition;

(5) The officer shall not rule on objections to the evidence. Evidence objected to shall be taken subject to the objections.

(d) When the testimony is fully transcribed, the deposition shall be submitted to the deponent for examination and signature, unless examination and signature is waived by the deponent. The officer shall certify the deposition or, if the deposition is not signed by the deponent, shall certify the reasons for the failure to sign.

(e) Where the deposition is to be taken upon written questions, the party taking the deposition shall serve a copy of the questions, showing each question separately and consecutively numbered, on every other party with a notice stating the name and address of the person who is to answer them, and the name, description, title and address of the officer before whom they are to be taken. Within 30 days after service, any other party may serve cross-questions. The questions, cross-questions, and answers shall be recorded and signed, and the deposition certified as in the case of a deposition upon oral examination.

(f) A deposition will not become a part of the record in the hearing unless received in evidence. If only part of a deposition is offered in evidence by a party, any other party may introduce other parts.

(g) The deponent may be accompanied, represented, and advised by legal counsel.

9. At the hearing, any part or all of a deposition, so far as admissible, may be used against any party who was present or represented at the taking of the deposition, or who had reasonable notice thereof, in accordance with any of the following provisions:

(a) Any deposition may be used by any party for the purpose of contradicting or impeaching the testimony of a deponent as a witness;

(b) The deposition of a party or anyone who at the time of taking the deposition was an officer, director, or managing agent or a person designated to testify on behalf of a public or private corporation, partnership, or association or governmental agency which is a party may be used by an adverse party for any purpose; or

(c) The deposition of a witness, whether or not a party, may be used by a party for any purpose if the hearing officer finds that:

(1) The witness is dead;

(2) The witness is at a distance greater than 100 miles from the place of hearing, or is outside the state, unless it appears that the absence of the witness was procured by the party offering the deposition;

(3) The witness is unable to attend or testify because of age, infirmity, illness or imprisonment;

(4) The party offering the deposition has been unable to procure the attendance of the witness by subpoena; or

(5) Such exceptional circumstances exist as to make it desirable, in the interest of justice and with due regard to the importance of presenting the testimony of witnesses orally at the hearing, to allow the deposition to be used.

10(a) Any party may serve upon any other party written interrogatories to be answered in writing by the party served, or if the party served is a public or private corporation or a partnership or association or governmental agency, by any officer or agent, who shall furnish such information as is available to the party. A copy of the interrogatories, answers, and all related pleadings shall be served on the hearing officer and upon all parties to the proceeding.

(b) Each interrogatory shall be answered separately and fully in writing under oath or affirmation, unless it is objected to, in which event the reasons for objection shall be stated in lieu of an answer. The answer and objections shall be signed by the person making them. The party upon whom the interrogatories were served shall serve a copy of the answers and objections upon all parties to the proceeding within 30 days after service of the interrogatories, or within such shorter or longer period as the hearing officer may allow.

(c) Interrogatories may relate to any matters which can be inquired into under subsection (3). An interrogatory otherwise proper is not necessarily objectionable merely because an answer to the interrogatory involves an opinion or contention that relates to fact or the application of law to fact, but the hearing officer may order that such an interrogatory need not be answered until after designated discovery has been completed or until a prehearing conference or other later time.

11(a) Any party may serve on any other party a request to:

(1) Produce and permit the party making the request, or a person acting on his behalf, to inspect and copy any designated documents or to inspect and copy, test or sample any tangible things within the scope of subsection (3) and which are in the possession, custody, or control of the party upon whom the request is served; or

(2) Permit entry upon designated land or other property in the possession or control of the party upon whom the request is served for the purpose of inspection and measuring, surveying,

photographing, testing, or sampling the property, (including the air, water and soil) or any designated object or operation thereon, within the scope of subsection (3).

(b) The request may be served on any party without leave of the hearing officer.

(c) The request shall:

(1) Set forth the items to be inspected either by individual item or category;

(2) Describe each item or category with reasonable particularity; and

(3) Specify a reasonable time, place, and manner of making the inspection and performing the related acts.

(d) The party upon whom a request is served shall serve on the party submitting the request a written response within 30 days after service of the request.

(e) The response shall state with respect to each item or category:

(1) That inspection and related activities will be permitted as requested; or

(2) That objection is made in whole or in part, in which case the reasons for objection shall be stated.

12(a) A party may serve upon any other party a written request for the admission, for purposes of the pending action only, of the genuineness and authenticity of any relevant document described in or attached to the request, or for the admission of the truth of any specified relevant matter of fact.

(b) Each matter of which an admission is requested is admitted unles, within 30 days after service of the request or such shorter or longer time as the hearing officer may allow, the party to whom the request is directed serves on the requesting party:

(1) A sworn statement denying specifically the relevant matters of which an admission is requested;

(2) A sworn statement setting forth in detail the reasons why he can neither truthfully admit or deny them; or

(3) Written objections on the ground that some or all of the matters involved are privileged or irrelevant or that the request is otherwise improper in whole or in part.

(c) An answering party may not give lack of information or knowledge as a reason for failure to admit or deny unless he states that he has made reasonable inquiry and that the information known or readily obtainable by him is insufficient to enable him to admit or deny.

(d) The party who has requested the admissions may move to determine the sufficiency of the asnwers or objections. Unless the hearing officer determines that an objection is justified, he shall order that an answer be served. If the hearing officer determines that an answer does not comply with the requirements of this section, he may order either that the matter is admitted or that an amended answer be served. The hearing officer may, in lieu of these orders, determine that final disposition of the request be made at a prehearing conference or at a designated time prior to hearing.

(e) Any matter admitted under this section is conclusively established unless the hearing offcier on motion permits withdrawl or amendment of the admission.

(f) Any admission made by a party under this section is for the purpose of the pending action only and is not an admission by him for any other purpose nor may it be used against him in any other proceeding.

* * *

4. The provision for intervention in administrative proceedings, 7:090 Section 11, represents a substantial attempt on the part of the drafters to bring the section into line with the federal requirement and current state rules regarding intervention. The one area in which it is still deficient is in the requirement of (2) that the petitioner for leave to intervene incorporate a statement of interest in all cases. Under current Kentucky rules, as well as the federal requirement, the requirement of showing of an interest which may be impaired is one of two standards; the other being that one had an unconditional statutory right to intervene or bring the initial action.

Under the permanent program, citizens with knowledge, but without legal "standing" in a judicial sense, will be able to initiate inspection and enforcement proceedings. The conferring of a right to maintain an action should be sufficient, rather than an additional requirement that the citizen claim an interest.

5. The Departmental position that the adoption of the costs and expenses criteria set forth in 43 CFR 4.1294 is not required under the Act, or is "fundamentally unfair," is untenable and obstructionistic. The Department has consistently waffled on the issue of awarding costs and expenses pursuant to the Act, showing a marked reluctance to include citizen parti-

cipation provisions where they will have an effect and cause either the industry or Department any time or trouble.

The requirement that the state program include provisions for costs and expenses consistent with the requirement of Section 525 of the Act is found in Section 503(a)(1) of the Act, which states:

> (a) Each State . . . which wishes to assume exclusive jurisdiction over the regulation of surface coal mining and reclamation operations . . . shall submit . . . a State program which demonstrates that such State has the capability of carrying out the provisions of this Act and meeting its purposes through-(1) a State law which provides for the regulation of surface coal mining and reclamation operations in accordance with the requirements of this Act . . . .

The requirements of Section 525, as a part of the Act, are clearly referenced through Section 503(a)(1) and are applicable to the states wishing to assume primacy. The definition of a "State program" approvable under Section 503(a), found at Section 701(25), as one which is established to regulate coal mining "in accord with the requirements of this Act and regulations issued by the Secretary pursuant to this Act" further supports the inclusive nature of Section 503 and the requirement that the state meet Section 525. If the Congress had wished to exclude certain provisions from the approvable state program, then they would have enumerated those provisions which were applicable to the state, in a fashion similar to the enumeration of applicable performance standards under Section 502. The Department's reliance on this argument is misplaced.

The second argument which is offered is that the regulations of the Secretary need not be followed by the Department, since they are either illegal or beyond the scope of the Act.

Section 503(a)(7) requires that the approvable state program contain "rules and regulations consistent with regulations issued by the Secretary pursuant to this Act." The requirement of consistency in the regulations (or regulations "in accord" with regulations issued by the Secretary under Sec.701(25)), demands that the state program adopt provisions for the award of costs and expenses consistent with the intent of Congress and the regulations promulgated at 43 CFR Part 4 by the Secretary.

The Department feels that the provision of Section 525, wherein it is stated:

> Whenever an order is issued under this section, or as a result of any administrative proceeding under this Act, at the request of any person, a sum equal to the aggregate amount of all costs and expenses (including attorney fees) as determined by the Secretary to have been reasonably incurred by such person for or in connection with his participation in such proceedings, including any judicial review of agency actions, may be assessed against either party as the court, resulting from judicial review or the Secretary, resulting from administrative proceedings, deems proper.

does not authorize the award of costs and expenses in the manner which OSM has proposed.

The first point which the Department seems to raise is that the "one-way" nature of the award is unfair, since "a permittee or the department must show bad faith . . . to recover costs and attorney's fees, while other persons need only make a 'substantial contribution to a full and fair determination of the issues.'" The argument must be separated into component points: the first being the necessity of prevailing on the merits; the second being the "fairness" or legality of the dual standards for awards.

The clear intent of Congress in enacting the costs and expenses provisions of both Section 520 and 525 was to encourage active citizen involvement in regulation of surface coal mining. The Conference Report to H.R. 2, at page 131, states that prevailing on the merits of a judicial or administrative challenge is not the standard for award of costs, wherein it states:

> This section gives the Secretary authority to award attorney's fees to compensate participants in the administrative process. The subsection does not require that the proceedings result in the finding of a violation nor does the fact that the Government was a party in an adjudicatory proceeding, or had caused the proceeding to be initiated prevent an award under the terms of this subsection.

Under the language of the section, interpreted in light of the legislative history contained in the Conference Report, the regulations of the Secretary which authorize an award of costs and expenses to a citizen where there is either a violation/imminent hazard situation established, or where a citizen has made a substantial contribution to the full and fair determination of the issues, is clearly an acceptable and rational regulation. The standard set out by Congress in Sec. 525 clearly suggests that prevailing on the merits (i.e. resulting in the finding of a violation) is not a prerequisite to an award. The implication of this is that the finding of a violation/imminent hazard will always create a situation where the Department may award costs and expenses; but that the standard for awards is not based on such a finding. The Secretary's regulation sets out a workable and fairly stringent standard for such awards; since Congress has stated that prevailing is not the standard, then a contribution that is substantial in nature is preferred to a standard which allows awards for mere participation.

The legislative history further clarifies that the award is proper in situations where the Government has initiated the proceeding, rather than merely situations arising from citizen requests for inspection and enforcement.

The Department seems overly concerned that the standard for award of costs and expenses is dual in nature; favoring the citizen over the industry. It must be remembered, in this current period of historical revisionism, that the Act is concerned with regulating an industry, not the public, and that the cornerstone of the Act is active citizen participation in all phases of the implementation of the Act: from development of the federal and state programs, to day-to-day monitoring and involvement in inspections and enforcement; from accompanying inspectors on the minesite to citizen suits for failure to enforce the Act by the Department.

In light of the desire, reflected in many provisions of the Act and the legislative history, to actively involve a segment of the public which has historically lacked the economic resources to challenge the industry, and to create a force of private attorneys general to protect the public interest, the standards for awards make perfect sense, and are very rational. The Department should concern itself less with protecting the industry from the public and more with guaranteeing citizen access at least at the minimum level demanded by PL 95-87.

The "dual" standard of the Secretary's regulations finds ample support in the regulations. The first prong, which authorizes awards to citizens who make a substantial contribution to a full and fair determination of the issues, has been discussed. The second, which limits awards to findings of bad faith and harassment on the part of the citizen, reflect a legislative intent and follow a long tradition of such standards in public interest, remedial legislation.

The counterpart to Section 525 is Section 520, the "citizen suit" provision. In discussing the costs and expenses provision under Section 520, the Committee Report states:

> This provision is intended to allow the courts to provide the traditional remedy of reasonable counsel fees to any party whenever appropriate. This provision will not deter citizens acting as private attorneys general from bringing good faith actions to insure the bill is being enforced by the prospect of having to pay their opponent's counsel fees should they lose. It is the committee's intention that this section be construed consistently with the history of similar Federal statutes providing for award of attorney's fees in citizen suit actions. [Citations omitted].

If there is any doubt that the Congress desired to insulate the good faith public litigant from awards of attorney fees against him whenever an enforcement review action was unsuccessful, the legislative history lays that to rest. In further discussing Section 520 (and necessarily Section 525), the Committee Report continued:

> Thus, it is the Committee's intention that this provision be construed consistently with the general principle that an award may be made to a defendant only if the plaintiff has instituted the action solely "to harass or embarass" the defendant. [citation omitted]. If the plaintiff is "motivated by malice and vindictiveness" then the court may award counsel fees to the prevailing defendant. [Citation omitted]. Thus, if the action is not brought in bad faith, such fees should not be allowed. [Emphasis supplied].

Since the intent behind the costs and expenses provision of Section 520 and that of 525 is identical, one pertaining to citizen-initiated suits for enforcement against the industry and the regulatory agency; the other pertaining more directly to review of inspection and enforcement, it follows that the provisions are to be construed in the same vein; i.e. that awards are made to citizens on the basis of substantial contribution, and against citizens only where bad faith and harassment is shown. It would appear that the difficulty which the Department has with the "fundamental unfairness" of the provisions is a problem more properly joined during the legislative debate in 1977 and preceeding years than at this late juncture, since the Secretary's regulations at 43 CFR Part 4 closely follow the Congressional mandate in this area.

The final argument joined by the Department in the response to Secretary's Andrus' findings, is that the administrative agency is limited by the Kentucky Rules of Civil Procedure from awarding costs and expenses in an administrative context. This analysis is as weak as the other justification erected to mask a fundamental unwillingness to adopt a core citizen participation provision in the state program.

The easiest answer to the Department's objection, simply stated, is that the Kentucky Rules of Civil Procedure are inapplicable to administrative proceedings. CR 1, which pertains to the "Title and Scope of Rules," states:

> (2) These Rules govern procedure and practice of a civil nature in the Court of Justice except for special statutory proceedings. . . .

The Kentucky Constitution defines the "Court of Justice" in the following fashion, at Section 109:

> The judicial power of the Commonwealth shall be vested exclusively in one Court of Justice which shall be divided into a Supreme Court, a Court of Appeals, a trial court of general jurisdiction known as the circuit court and a trial court of limited jurisdiction known as the district court.

It is clear that, by definition, an administrative agency which is not the adjunct of one of the courts cannot be a part of the "Court of Justice" and hence is outside of the scope of the Kentucky Rules of Civil Procedure. Thus the administrative agency is not bound by the strictures perceived in Civil Rule 54.04, which apply solely to Courts.

Civil Rule 54.04 itself provides no restrictions on the ability of a party to have costs assessed, at the Department's discretion, against the Department. The section, in pertinent part, simply states:

> (1) Costs shall be allowed as of course to the prevailing party unless the court otherwise directs; but costs against the Commonwealth, its officers and agencies shall be imposed only to the extent permitted by law. [Emphasis added].

The language of KRS 350.465(1)(d) mandates that the Department shall include in its permanent regulatory program:

> (d) Procedures for the adminsitrative and judicial review of all actions of the Department to administer and enforce the provisions of this chapter, including the award of costs and expenses (including attorney's fees and expert witness fees) by the department or the court. [Emphasis added].

It is clear from the language of the statute that the Department has been authorized and directed by the Kentucky General Assembly to award costs and expenses in administrative proceedings, in a manner consistent with the provisions of Public Law 95-87. Thus, even granting the applicability of CR 54.04 to this situation, the Department is in no ways restricted, and is in fact commanded, to award such costs and expenses by the government as well as between parties.

The citizens task force suggests the adoption of the following criteria for the award of costs and expenses in administrative proceedings, consistent with the requirements of 30 CFR 840.15 and Sections 520 and 525 of the Surface Mining Control and Reclamation Act of 1977:

Petitions for award of costs and expenses:

(1) Any person may file a petition for award of costs and expenses including attorney's fees reasonably incurred as a result of that person's participation in any administrative proceeding under Chapter 350 which results in a final order being issued by the Secretary.

(2) A petition filed under this section shall include the name of the person from whom costs and expenses are sought and the following shall be submitted in support of the petition:

(a) An affidavit setting forth in detail all costs and expenses including attorney's fees reasonably incurred for, or in connection with, the person's participation in the proceeding;

(b) Receipts or other evidence of such costs and expenses;

(c) where attorney's fees are claimed, evidence concerning the hours expended on the case, the customary commercial rate of payment for such services in the area, and the experience, reputation, and ability of the individual or individuals performing the services. Failure to make a timely filing of the petition with the Secretary within 45 days of receipt of such order may constitute a waiver of the right to such an award.

(3) Any person served with a copy of the petition shall have 30 days from service of the petition within which to file an answer.

(4) Appropriate costs and expenses including attorney's fees may be awarded:

(a) To any person from the permittee, if the person initiates any administrative proceedings reviewing enforcement actions, upon a finding that a violation of KRS Chapter 350, 405 KAR Chapter 7 through 24 or the permit conditions has occurred, or that an imminent hazard existed, or to any person who participates in an enforcement proceeding where such a finding is made if the hearing officer determines that the person made a substantial contribution to the full and fair determination of the issues.

(b) To any person, other than a permittee or his representative, from the Department if the person initiates or participates in any proceeding under Chapter 350 upon a finding that the person made a substantial contribution to a full and fair determination of the issues.

(c) To a permittee from the Department when the permittee demonstrates that the Department issued an order of cessation, a notice of violation or an order to show cause why a permit should not be suspended or revoked, in bad faith and for the purpose of harassing the permittee; or

(d) To a permittee from any person where the permittee demonstrates that the person initiated an administrative or judicial review proceeding or participated in such a proceeding in bad faith for the purpose of harassing the permittee;

(e) To the Department where it demonstrates that any person applied for review of enforcement action or that any party participated in such a proceeding in bad faith and for the purpose of harassing the Department.

* * * * * *

6. The next comment pertains to the filing requirement of 16:120 Section 2, with regards to pre-blast surveys. The federal requirement is that a copy of each and every pre-blast survey undertaken by the permittee be sent to the regulatory authority, in all cases. The state has proposed that the permittee comply with this only "on request" of the Department, and requests that the Office of Surface Mining reconsider its disapproval of this section.

The pre-blast survey is an important tool for protecting both the citizen and the coal producer. In order that the survey have the intended effect of providing an accurate record or the condition of a dwelling pre-blasting, the quality and frequency of such surveys conducted under the auspices of PL 95-87 must be monitored by the Department. The keeping of such records will aid in determining systemic violations of the law, as well as insuring that the surveys are conducted where mandated. The state should reconsider its regulation and amend it to be consistent with the federal counterpart at 30 CFR 816.62.

7. The citizen task force supports the inclusion of the historic cost criteria in determining what is an adqeuate bond amount under 10:020 Section 1(4), and the incorporation of mandatory criteria for bond revocation under 10:050 Section 3(1)(a).

However, the Department decision to retain the modifier "substantially" in the regulation relating to when augmented seeding will trigger a new period of liability, and in the regulation governing when bond amounts may be adjusted, threatens to undermine efforts to adjust bond amounts for effective coverage, and to allow release of bonds prematurely.

The Secretary requested that Kentucky specify, pursuant to the revised federal regulations, specific husbandry practices which would not be considered "augmented seeding" so as to trip the five year period of liability again. Kentucky has instead chosen to cling to a vague standard which will lead to interminable litigation, and premature bond release. The key should be rewarding good husbandry practices by specifying more precisely what is acceptable practice.

With regard to the use of "substantially" as a modifier in Section 4 of 10:020, the Department is hampering its own ability to adjust bond amounts where it is apparent that the amount has become insufficient for projected reclamation costs. The phrase serves no other purpose than to invite under-coverage; a problem which has plagued the Department and dwarfed the funds available under the abandoned mine land program. There exists sufficient discretion within the current federal provision regarding adjustment of bond amount, without including such restriction. The language should be deleted as inconsistent with 30 CFR 805.14.

8. 16:130 Section 2(3) is less stringent than the federal counterpart regarding the four-foot maximum thickness restriction for valley fill lifts. The Department has taken a position that this is "arbitrary."

In this and other areas where the Department has shown reluctance to incorporate federal performance standards due to scientific or technical reasons, the Department should present their problems in a different forum. We suggest that the Department consider requesting a state window, if there is a geographic rationale for such alternative approaches, or that the Department plan to allow a certain number of experimental practices variances in order to develop the data, and then petition to initiate a rulemaking. The petition process is well-suited for such changes, if they are supportable with a technical/scientific rationale.

Senator **Warner**. Thank you very much.

Mr. **FitzGerald**. I will be happy to answer any questions.

Senator **Warner**. We will hear from all and then we will take the questions.

Ms. Freeman.

STATEMENT OF JENNY FREEMAN, EXECUTIVE DIRECTOR, TENNESSEE CITIZENS FOR WILDERNESS PLANNING

Ms. **Freeman**. I am Jenny Freeman, executive director of Tennessee Citizens for Wilderness Planning, a statewide conservation organization. I appreciate being placed on this hearing agenda today. For many years, TCWP has been involved in surface mining issues, in east Tennessee, both on the State and Federal levels, and it is important, as I am sure you will agree, that local grassroot organizations such as the one that I represent be included on any public participation panel, such as we provided today.

I guess we are providing the balance here, the four of us and others.

TCWP has over 400 members in Tennessee, some of whom have helped to draft surface mining legislation on both the State and Federal levels, and many of whom have had considerable involvement in surface mining issues over the years.

I am pleased to represent them here today. I might make the point that I am here not only out of concern for the protection of those natural areas, scenic rivers that our organization works so hard for, but also out of a larger concern for the watershed, the forests, and the land that surrounds our wild areas that are so crucial in maintaining the quality of environment in our protected areas.

In my prepared testimony, which I am summarizing now, I express particular concerns of TCWP about surface mining issues, and I guess being from Tennessee, I would like to go on record now as completely supporting Maureen O'Connell's testimony. A lot of concerns that she expressed from SOCM are concerns that TCWP has. I will not repeat those to save time.

However, two of those concerns I will enumerate for you. One of them is that the 1977 Surface Mining Act might be reopened and, you know, encourage us with that today. We are afraid that if that act were reopened, it would be amended and subsequently weakened by an administration that has had no involvement in writing the act, no experience in formulating the regulations, and just a short history in implementing the act and its regulations.

A second major concern of ours is about the reorganization of the Office of Surface Mining, a hastily conceived plan that will remove technical expertise and much needed enforcement services from the Tennessee coalfields.

The cause of our concern about these two issues is that both of them, an amendment to weaken the act and a reorganization of the OSM, represent a withdrawal or perhaps an outright elimination of Federal enforcement of surface mining on the State level. TCWP fears that a withdrawal of Federal oversight in Tennessee would not be in the best interests of anyone, except those of mine operators.

Now I know that the act meant that the State should receive primacy and, therefore, be responsible for enforcing its own program. I believe on the whole that the State program is well intended, but, however, because partly of a failure to provide adequate salary for its inspectors, the division of surface mining in Tennessee cannot seem to hire and then keep anyone with the technical expertise, or very many people with the expertise necessary to conduct the type of aggressive enforcement that Tennessee needs.

Also, there appears to be tremendous political and otherwise pressure on administrators of the program to perhaps not be as strict as is necessary nor to provide adequate support for field inspectors when they do report a violation. Whatever the case, the State division of surface mining in Tennessee has not demonstrated that it can conduct a job of enforcement that should give it the opportunity and privilege to operate its own program.

I detailed in my testimony just a few of what seemed to me to be some of the more incredible shortcomings of the State program. A lot of those were voiced by Maureen, and I will not repeat them now.

These are our major concerns, Senator Warner, and because of the great doubts that we have about the ability of the State of Tennessee to conduct an adeqquately aggressive enforcement program alone, we urge the subcommittee not to reopen the 1977 act, and we urge that Federal enforcement and oversight of the State program not be cut back or withdrawn, and we also urge that the proposed reorganization of the Office of Surface Mining be scrutinized very closely and try to look ahead to see what the effects of removing the technical expertise and the enforcement services that the OSM is offering us now, see what the effects of that reorganization will be.

A regional office will be moved out of Knoxville to Pittsburgh, thereby eliminating a lot of the services that it provides for Kentucky, Tennessee, these areas that are so crucial right now.

Thank you for your attention and I appreciate being here.

[The prepared statement of Ms. Freeman follows:]

TENNESSEE CITIZENS for WILDERNESS PLANNING

For The Preservation and Enjoyment of Our Wild Lands and Waters

130 Tabor Road
Oak Ridge, Tenn. 37830
Telephone 615-482-2153

TESTIMONY OF THE TENNESSEE CITIZENS FOR WILDERNESS PLANNING BEFORE THE ENERGY AND MINERAL RESOURCES SUBCOMMITTEE OF THE SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES.

September 2, 1981

I am Jenny Freeman, Executive Director of Tennessee Citizens for Wilderness Planning (TCWP), a state-wide conservation organization. TCWP was formed in 1966 and has been active for several years in surface mining issues, both on the state and federal levels. The focus of our involvement has come primarily through a very active surface mining committee. Since 1972, this committee working on behalf of the 400-plus members of TCWP has helped to draft state surface mining legislation and has provided expert consultation on problems and situations peculiar to the East Tennessee coal mining areas to those individuals drafting federal legislation. Our members retain a strong interest in surface mining issues, but not in just those issues that only affect the natural areas that we attempt to preserve. Our concerns about surface mining extend into farther reaching areas such as the watersheds that surround our national rivers and wilderness areas so that the water quality in these protected places may remain untainted from surface mining spoil. We attempt to keep track of the enforcement of state and federal regulations and we support and work closely with those people and citizen groups directly associated with surface mining issues in East Tennessee.

Out of our long interest and involvement in surface mining in Tennessee, I would like to express the following concerns, on behalf of the membership of TCWP, for the hearing record.

1. We are extremely disturbed by hints that the Surface Mining Act of 1977 will be amended by the present Administration, resulting in the weakening of many of the controls of surface mining and mine reclamation.

2. We are also very concerned about the reorganization of the Office of Surface Mining (OSM) that has been proposed by Secretary of the Interior, James G. Watt.

2. TCWP

TCWP members consider these concerns to be very serious because both an amendment of the Act and a reorganization of the Office of Surface Mining represent a retreat or perhaps an outright elimination of federal oversight of surface mining enforcement on the state level. TCWP believes that a retreat of federal oversight in the State of Tennessee will have grave consequences, not only for the natural environment of coal producing areas, but for the health and safety of those citizens living in communities near these areas.

The primary reason that TCWP fears the drawback of federal enforcement in Tennessee is because the state regulatory agency, the Department of Surface Mining (DSM), historically has been unable to provide adequate enforcement of surface mining regulations. While we believe that basically the DSM is well-intentioned, we feel that partly because of the extremely low salaries paid to inspectors, the DSM cannot attract people with the technical expertise to conduct an aggressive enforcement program. In Tennessee, the enforcement record of the DSM is so poor that without federal oversight of the state program, enforcement of surface mining regulations will quite likely be nonexistent. The opinion of many administrators in the Department of Interior today seems to be that once states receive primacy to oversee their programs, federal oversight of states will no longer be necessary. The 1977 Act never intended for that to be the case. The state regulatory agencies are certainly to be foremost in enforcement; but federal oversight must remain a strong component in ensuring that environmental and health and safety standards are scrupulously upheld.

When debating the role of the federal government in state regulatory programs, one has only to look at the enforcement record of the Tennessee DSM to erase any doubt concerning the necessity of federal oversight. Please consider the following information that illustrates the quality of surface mine enforcement that the DSM has established in the past.

1. In most enforcement proceedings, too many months are allowed to elapse between the time of the violation and the forfeiture of the bond if the violation is not corrected. An average of 11 months has been found to elapse between issuance of a first Notice of Non-Compliance and the issuance of a Notice of Bond Forfeiture (A Study of Tennessee Strip Mine Enforcement, 1981: 6). Eleven months is more time than necessary for serious environmental damage to occur.

3. TCWP

2. There exists no formal training program for state enforcement inspectors and likewise, performance criteria for operators have never been developed. In a similar vein, a formal evaluation of inspector performance has never been established. An absence of performance standards has resulted in excessive violations by one company after another simply because of the ease with which the violators escape scrutiny and evaluation.

3. The 1980 state law is understandable complex and can be enforced only with a full set of cross-referenced records on each permitted operation. These records should detail all violations, the various names of the operations and the names of all corporation officers with 10% or more interest in the operation (Ibid, 16). Studies have shown that the DSM is operating its enforcement program without the aid of such records. In some instances, past violations are in fact on record at the DSM, but the information is not easily retrieveable, which renders it unavailable for checking new permit applications. This incredible information gap has resulted in some violating operations, which have forfeited their bonds, simply changing the names of their companies and applying for new permits. The violators know that the DSM's deplorable record-keeping system will enable them to escape inspection and possible permit denials when they apply for new permits.

4. Wildcatting (or operating without a permit) continues to be an enormous problem confronting Tennessee surface mine enforcement. The 1980 state law has defined strict enforcement actions aimed at curbing wildcatting incidents; but these enforcement actions have largely been ignored in the past by DSM inspecotrs and illegal mining activities have been allowed to continue. In the 12 years of the DSM's existence, wildcatters have been fined only five times even though the law calls for automatic fines where orders have been issued (Ibid, 12). The fines that have been assessed have been pitifully small when compared to the income made by the wildcatter in the sale of coal, making these relatively small sums no real deterrent to illegal mining.

5. There appear to exist large discrepancies between enforcement action taken by federal OSM inspectors and state DSM inspectors. During a 16 month period in Tennessee, it was found that OSM issued Notices of Violations and/or Cease Orders to 173 operations. Within those 173 operations, 110 were found to be permitted while 63 were wildcat operations. Of the 110 permitted operations that were issued OSM Notices of Violation and/or Cease Orders, 71 (64%) had not been issued either a Notice of Non-Compliance or a Cease Order

from the DSM (Ibid, 10). These very fundamental statistics reveal the variances between the ability of federal enforcement officials and that of state officials to conduct an adequately strict regulatory program.

Because of these and other rather alarming facts, TCWP urges this committee to recommend that the federal Act be upheld in its entirety, and that federal enforcement of the state surface mining program be continued at the very least at its present strength. We in Tennessee are going to need all the assistance in enforcement that we can get, especially if Secretary Watt's proposed reorganization of the Office of Surface Mining is carried out. The East Tennessee coal fields stand to lose its regional OSM office in Knoxville, resulting in a severe loss of technical expertise, enforcement and inspection capablities, and abandoned mine and reclamation programs. Removal of federal inspection and enforcement, we fear, will only result in competition between this state and others to have the most lax surface mine regulations so that industry will have no excuse not to locate in our area. While we do not oppose planned industrial growth, TCWP feels that strict controls on such growth are essential in protecting the irreplaceable natural resources of our land and water and of the health and safety of our citizens. Only through a stricy adherence to the federal surface mining law and its regulations can Tennessee protect our wealth and the future prosperity and health of our people.

Thank you for this opportunity to appear before this committee.

Reference: " A Study of Tennessee Strip Mine Enforcement", 1981. Save
Our Cumberland Mountains: Jacksboro, Tennessee.

Senator **Warner**. Thank you, and I thank all members of the panel for your testimony. In my judgment, you are exemplary in representing the environmental interests; we have provided careful substantive observations, in an emotionally balanced way. I say that quite frankly. I think some people think environmentalists tend to become too emotional now and then, but I thought your perspective here is very balanced.

I would like to give you the opportunity now that you have heard the testimony this morning, perhaps to ask some questions of me since much of this responsibility will ultimately fall on me as chairman of the subcommittee. Is there anything that you would like to put in the record to me which I will endeavor to answer now or in written communication with you?

Ms. **Freeman**. I would like to know how you feel about the reorganization of Surface Mining, what you think the effects will be on our particular area.

Senator **Warner**. My first impression is that it was an effort to cut down and reduce the size of Government, which we are trying to do widespread. You know, I have been in and out of Government a good deal of my life, and one time managed a very large Government department, and then a modest size Government department. I have always taken the viewpoint that when a new manager comes in, he or she should be given a reasonable period of time within which to achieve such reorganization as deemed advisable.

As I stated in the press conference, it is my intention to hold another one of these oversight hearings, perhaps in the fall of 1982, and at that time we will ask you to come back and we will have an opportunity to observe the track record so to speak of the new Director of the Office of Surface Mining and the effect of the revised regulations which should take place this summer.

Any other questions or suggestions? I judge again from your comments——

Ms. **O'Connell**. I just have one comment. I think it is unfortunate that the word "environmentalist" has the connotation that it has.

Senator **Warner**. You have just proved it today.

Ms. **O'Connell**. But I think the other thing I want to mention very clearly, besides the environmental organizations, many of the people that we work with and who are members of some of the organizations up here, do not call themselves environmentalists, they call themselves ordinary citizens who are trying to live a life in the community in which they were born and raised, and we are bombarded and assaulted and the reasons why people have formed organizations, not necessarily only to save the environment, is to save their homes, and is to protect a way of life in their own comunities. That is, you know, I think is a point that is often cast aside by the attempt to lump everybody in some special brand, although I think it is unfortunate, because environmentalism should be a very positive thing, people concerned about the resources of the country.

Senator **Warner**. It is positive with me, I assure you. My efforts in this area throughout my tenure in the Congress will be to seek a balance between the interests.

I thank you again and I presume from your observation and comments that this subcommittee has treated you fairly and given you the opportunity that you desire. Thank you very much.

We have a special request from Mr. Gillman, who had some travel difficulties in arriving here this morning, and who must depart this afternoon at 4. At this time I wonder if we might depart from the order that I had previously announced and provide him the opportunity to put in his statement and make a general summary. Mr. Gillman is Deputy Chief of State and Local Operations, Soil Conservation Service, U.S. Department of Agriculture.

STATEMENT OF CLETUS J. GILLMAN, DEPUTY CHIEF, STATE AND LOCAL OPERATIONS, DEPARTMENT OF AGRICULTURE

Mr. **Gillman**. My name is Clete Gillman. I'm the Deputy Chief, State and Local Operations, Soil Conservation Service (SCS), U.S. Department of Agriculture (USDA). My testimony today deals with the rural abandoned mine program (RAMP), administered by the Soil Conservation Service. RAMP is the reclamation program authorized by section 406 of Public Law 95–87, the Surface Mining Reclamation and Control Act of 1977. Section 406 deals only with abandoned coal mine reclamation, therefore RAMP is not involved in active mining control or enforcement.

RAMP is one of four abandoned mine reclamation programs authorized by title IV of the act. However, it is the only one under which reclamation is based solely on voluntary participation. RAMP does not have land acquisition or condemnation authority nor authority to place liens against property reclaimed. In order to assure coordination with other reclamation programs, SCS utilizes a State reclamation committee in each active State. Through these committees all activities are coordinated closely with State reclamation agencies, the Office of Surface Mining and others interested in reclamation, such as the State health agency, environmental groups and the State water quality agency. This approach avoids duplication of effort with the reclamation requests being directed to the appropriate program and provides a cooperative State-Federal attack on the abandoned mine reclmation problem.

The Secretary of Agriculture is authorized to enter into agreements of no more than 10 years with landowners to provide "for land stabilization, erosion and sediment control, and reclamation through conservation treatment, including measures for the conservation and development of soil, water (excluding stream channelization), woodland, wildlife, and recreation resources, and agricultural productivity" of abandoned coal lands eligible for reclamation until title IV of the law.

USDA has identified 1.1 million acres in 29 States (377 counties) as eligible. (See map, enclosure 1.) USDA has received 2,876 valid applications for assistance in 20 States covering 90,983 acres; 1,560 of these applications are classified as high priority; that is, extreme danger to life, property, or public health, safety and welfare hazards. The most common problems identified are hazardous highwalls, open mine shafts, acid or toxic drainage, unsafe structures, hazardous waste or refuse dumps, subsidence, areas prone to dangerous slides, and sedimentation of surface waters. Other problems for which we have received applications for assistance, but occurring less frequently, are open dumps, disrupted public water supply, blowing mine dust, flooding, mine fires, and acid seepage from underground mines.

Section 401(C)(2) of the act authorizes "up to one-fifth of the money deposited in the funds annually and transferred by the Secretary of the Interior to the Secretary of Agriculture," to be used under section 406 by the Secretary of Agriculture. The fund referred to is the abandoned mine reclamation fund. Coal mine operators pay a fee of 35 cents per ton on coal produced from surface mining and 15 cents (10 cents if lignite) per ton of coal produced by underground mining to finance the fund.

RAMP's final rules were promulgated on October 2, 1978. Field operations were initiated in the spring of 1979 with acceptance of applications voluntarily submitted by interested participants. Of the 2,876 applications received, 137 contracts covering 2,899 acres had been signed as of the end of fiscal year 1980. Reclamation was completed or underway on 57 of the contracts, with 843 acres reclaimed at the end of fiscal year 1980. Eighty three health and safety hazards have been eliminated, 462 acres of water and visual quality improved, and 163 acres of wildlife habitat established. Cost of reclamation averages approximately $110,000 per contract. An average contract covers 21 acres. Additional details on accomplishments are included in enclosure 2. (I have here some before and after 8- by 10-inch photos showing one example of reclamation accomplished through RAMP.)

You have probaply heard about the income tax problem that has caused concern among the potential program participants. The Internal Revenue RAMP [IRS] has stated that payments for reclamation through RAMP are to be considered as income to the participant. Public Law 95–600 (Revenue Act of 1978) enacted provisions to correct this disincentive. It provided that certain payments, or portions thereof, received through Federal and non-Federal programs can be excluded from gross income. This is possible if the Secretary of Agriculture determines they are made primarily for the purposes of conserving soil and water resources, protecting or restoring the environment, improving forests or providing wildlife habitat; and to the extent the Secretary of Treasury determines that the payments do not increase substantially the annual income derived from the property associated with the payment. USDA published a determination on January 8, 1981, stating that all RAMP payments were for the purpose of protecting or restoring the environment.

IRS published temporary rules on May 21, 1981. However, due to their complexity and lack of clarity, the impact of these rule is not clear. While many applicants, after consulting their tax advisers, are signing contracts, some are still reluctant to do so. This has reduced demand somewhat, but the number still desiring contracts greatly exceeds fund availability.

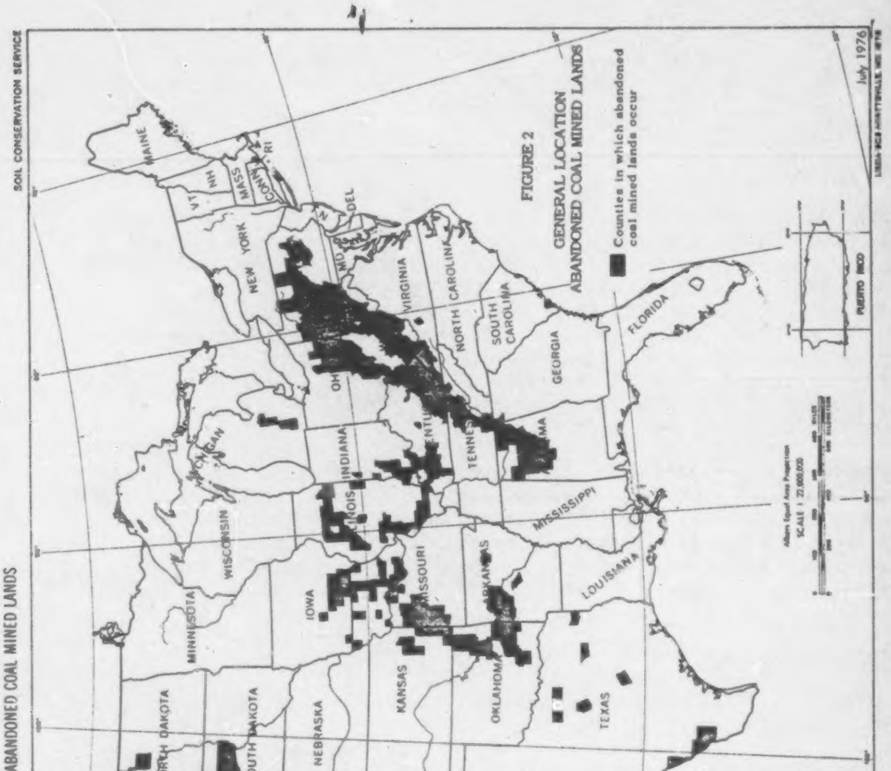
Eleven applications have been received in Virginia. There has been some hesitation by landowners to apply for RAMP assistance because of litigation over other aspects of the surface mining law even though RAMP and reclamation of abandoned lands are not involved. Virginia has one contract ready for signing pending fund availability. It is a high priority site in Dante, Va. A 300-foot high refuse pile is located immediately behind several houses and along the stream on up the valley. The refuse pile is unstable and very prone to a slide which can destroy homes and lives or dam up the stream creating a Buffalo Creek, W. Va., type of hazard. Reclamation will cost approximately $1 million to eliminate this danger of life and property.

The fund level requested for RAMP for fiscal year 1982 is $4.3 million which will allow SCS to service existing contracts. It is expected that when State-abandoned mine reclamation programs, also funded from the abandoned mine fund, are fully implemented, many of the contract applications which SCS has already received and approved will be carried out under State auspices according to priorities established for the abandonment mine land programs. Since Virginia's both regulatory programs and reclamation programs have been submitted to the Department of the Interior, it appears that Virginia's abandoned mine reclamation program will be underway in calendar year 1982.

I appreciate the opportunity to appear at the hearing.

[Attachments to Mr. Gillman's statement follow:]

Enclosure 1



GENERAL LOCATION ABANDONED COAL MINED LANDS

FIGURE 2

GENERAL LOCATION ABANDONED COAL MINED LANDS

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
■ Counties in which abandoned coal mined lands occur
July 1976
WASHINGTON
OREGON
CALIFORNIA
NEVADA
IDAHO
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LOUISIANA
WISCONSIN
MICHIGAN
INDIANA
MISSISSIPPI
TENNESSEE
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
NEW YORK
MAINE
VT
NH
MASS
CONN
RI
NJ
MD
DEL
ALASKA
Principal Islands of HAWAII
PUERTO RICO

Enclosure No. 2

Rural Abandoned Mine Program (RAMP)
Annual Report FY 1980
(Revised)

General

RAMP is authorized by Section 406 of the Surface Mining Control and Reclamation Act (SMCRA) for the purpose of reclaiming the soil and water resources of rural lands adversely affected by past coal mining practices. The program is administered by the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS), and may use up to one-fifth (20 percent) of the money deposited in the Abandoned Mine Reclamation Fund. Total appropriations made available to RAMP since the beginning of the program total $25.2 million or 5 percent of available funds of which $14.5 million were available for use during FY 1980.

The program provides technical and financial assistance to land users who voluntarily enter into 5- to 10-year contracts for the reclamation of up to 320 acres of eligible abandoned coal-mined lands and waters. A reclamation plan is required for financial assistance under the program. The plan is prepared by the land user with SCS technical assistance and sets forth the objectives, type, and amount of reclamation required.

RAMP Operations

A total of 2,876 program applications involving 91,000 acres of eligible abandoned lands has been submitted to SCS by land users within 20 States. All of these applications have been processed and assigned a priority for assistance: 596 are classified as priority one, 964 are classified as priority two, and 1,314 are classified as priority three. Approximately 18 of these applications were referred to the Office of Surface Mining (OSM) for reclamation under the emergency provisions of the Federal program. SCS is also providing technical assistance under a cooperative agreement with OSM to implement an $850,000 contract in Kansas.

To date, SCS has signed a total of 137 contracts for the reclamation of 2,899 acres, which obligated $14.8 million. Of this amount, 74 contracts totaling $8.0 million were signed in FY 1980. Technical and financial assistance in FY 1980 used approximately 93 percent of the available funds. Reclamation is completed or underway on 57 of the contracts and 843 acres have been reclaimed. The reclamation has eliminated 83 health and safety hazards, improved water quality or visual quality on 462 acres, and provided wildlife habitat on 163 acres. Costs of reclamation average $107,836 per contract exclusive of the technical assistance required.

The determination that payments under RAMP are made for the purpose of protecting or restoring the environment was issued by USDA on 1/2/81. This is step one of a two step process that will aid taxpayers in identifying the amount of cost-share payments that may be excluded from gross income. The Internal Revenue Service is responsible for establishing criteria for determining the amount of the exemption (step two). These regulations should become available in fiscal year 1981. Many land users have in past years been reluctant to sign program contracts until the income tax status of Federal cost-share payments is fully determined. However, this trend is now changing. A large number are proceeding with contracts after discussing the tax law amendment with their tax consultants.

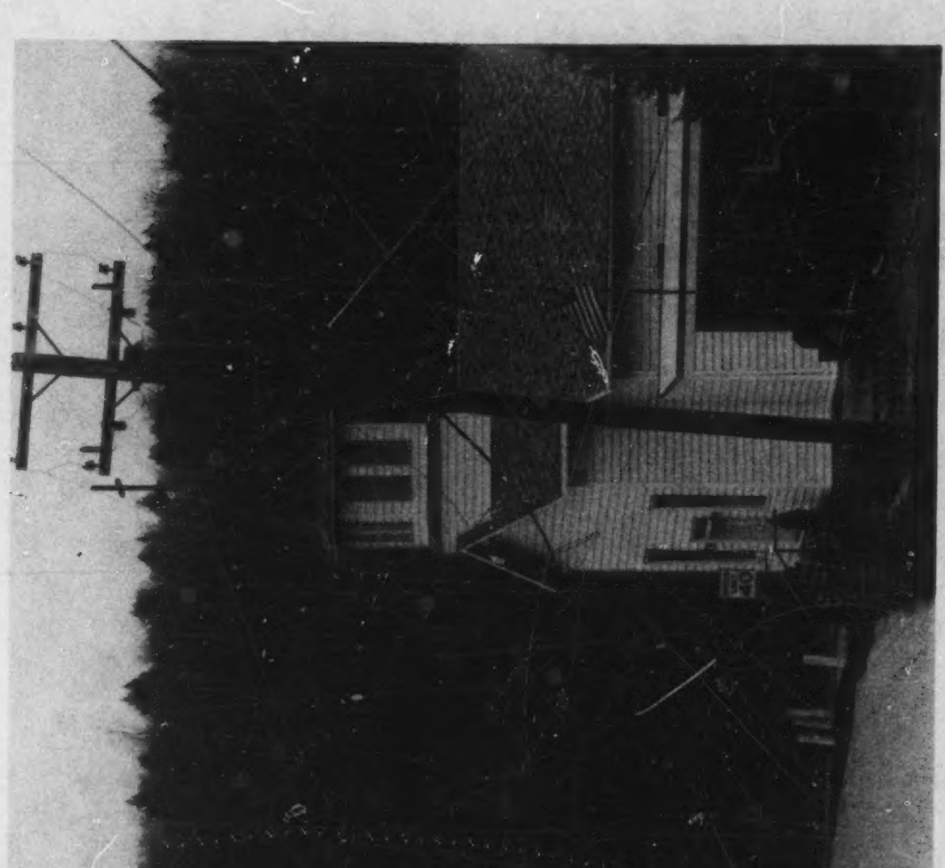
A table summarizing program progress by State is enclosed.

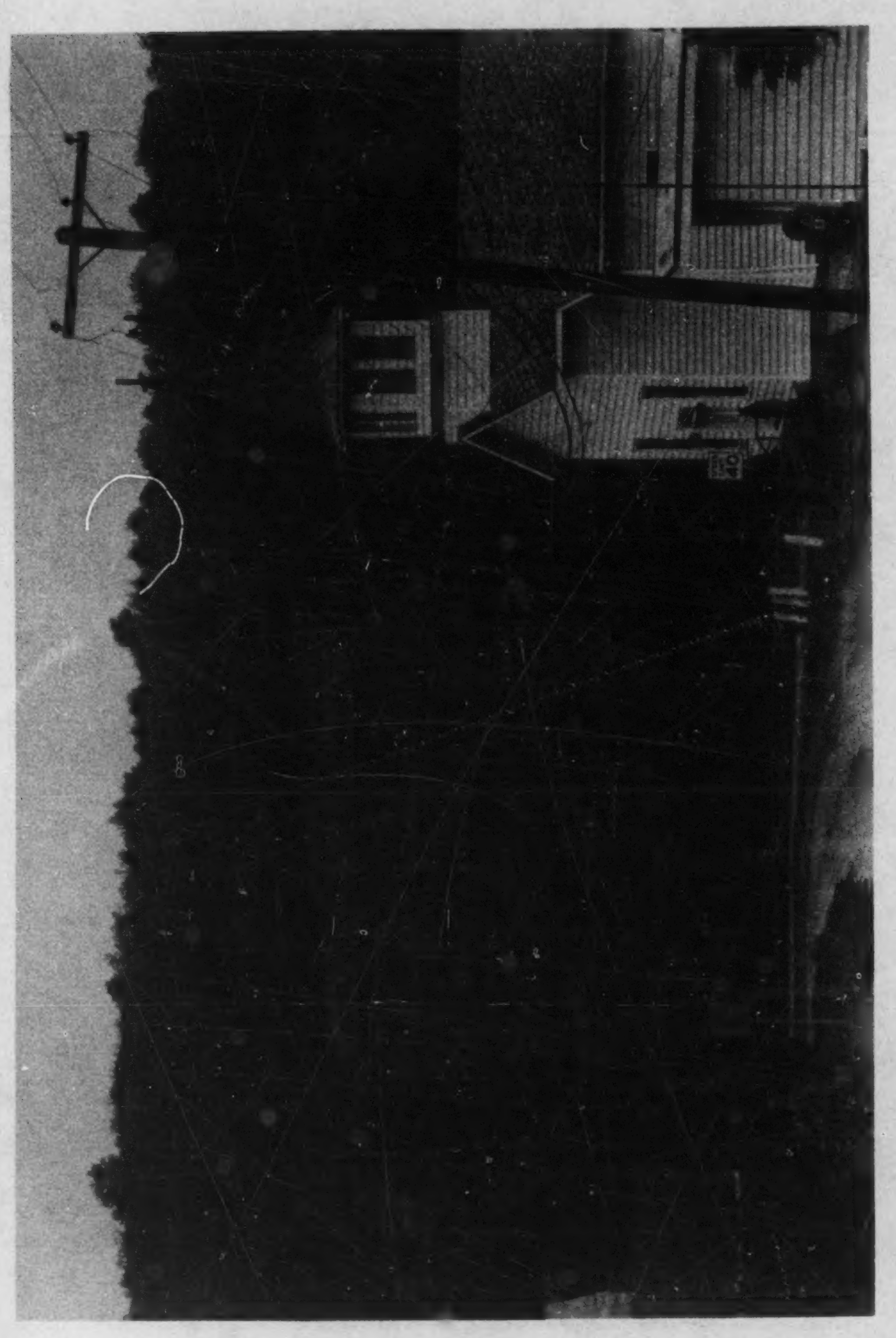
RAMP ANNUAL REPORT - FY 1980

	Applications					Contracts					
	No. by Priority 1	2	3	Total No.	Acres	Total No.	Acres	No. FY 1980	Dollars[1] Obligated FY 1980	Acres Reclaimed	No. Hazards Eliminated
Alabama	19	5	39	63	793	13	268	10	859,782	0	0
Arkansas	15	40	21	76	2,256	6	65	1	(427,493)	0	0
Illinois	14	110	113	237	16,286	4	32	2	52,152	0	0
Indiana	50	26	52	128	2,921	7	198	4	106,618	128	6
Iowa	19	64	196	279	8,463	8	208	4	850,605	102	9
Kansas	1	8	70	79	4,160	0	0	0	0	0	0
Kentucky	47	145	99	291	5,858	8	300	1	175,776	57	1
Maryland	4	9	16	29	353	3	33	3	475,000	13	4
Missouri	1	20	47	68	5,402	3	200	0	0	0	1
Montana	1	9	1	11	910	0	0	0	0	0	0
North Dakota	19	38	6	63	1,884	1	80	1	57,382	12	1
Ohio	24	107	355	486	17,087	20	166	14	1,008,973	67	4
Oklahoma	15	17	3	35	1,787	3	208	3	452,988	0	0
Pennsylvania	290	253	151	694	13,621	22	329	15	2,510,180	67	32
South Dakota	0	3	2	5	235	2	55	2	246,372	0	0
Tennessee	0	9	11	20	930	12	79	3	102,000	37	7
Texas	0	24	2	26	727	15	484	8	396,825	341	14
Virginia	2	2	7	11	90	0	0	0	0	0	0
West Virginia	68	75	121	264	7,000[2]	5	34	0	57,423	7	3
Wyoming	9	0	2	11	220	5	160	3	1,055,310	12	1
TOTAL	598	964	1,314	2,876	90,983	137	2,899	74	7,979,893	843	83

[1] Financial assistance including $221,000 for modifications of 1979 contracts exclusive of technical assistance.

[2] Estimated.

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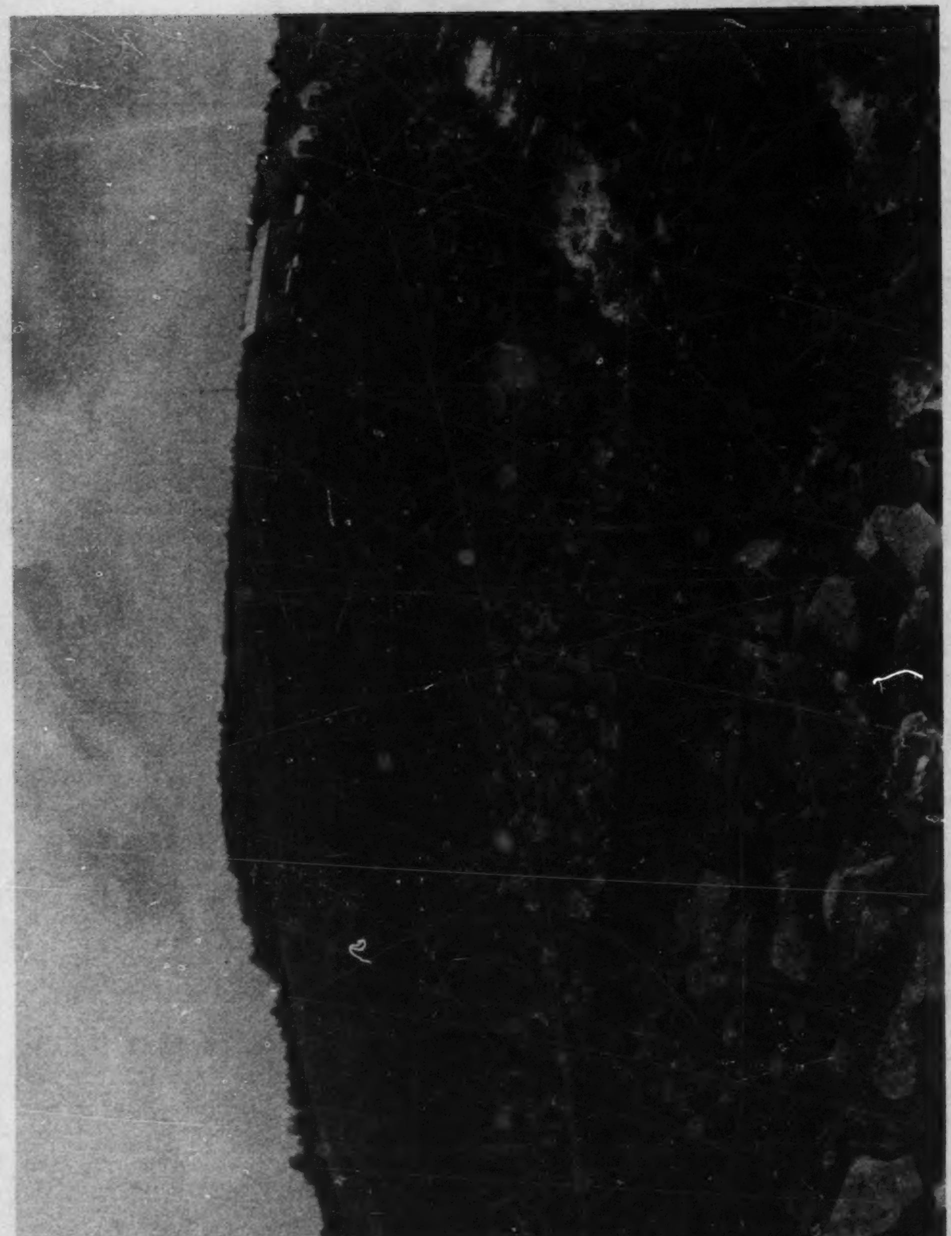
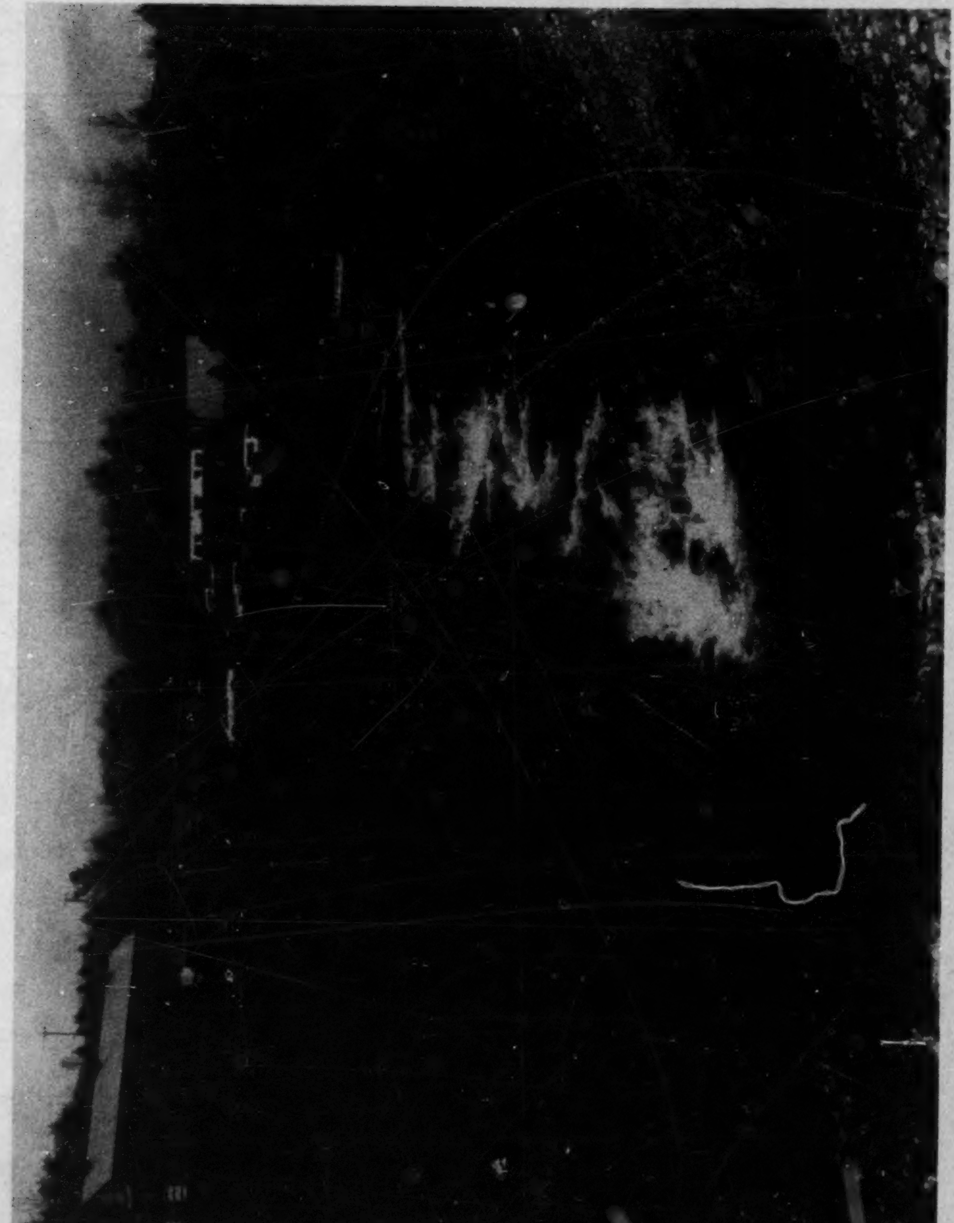
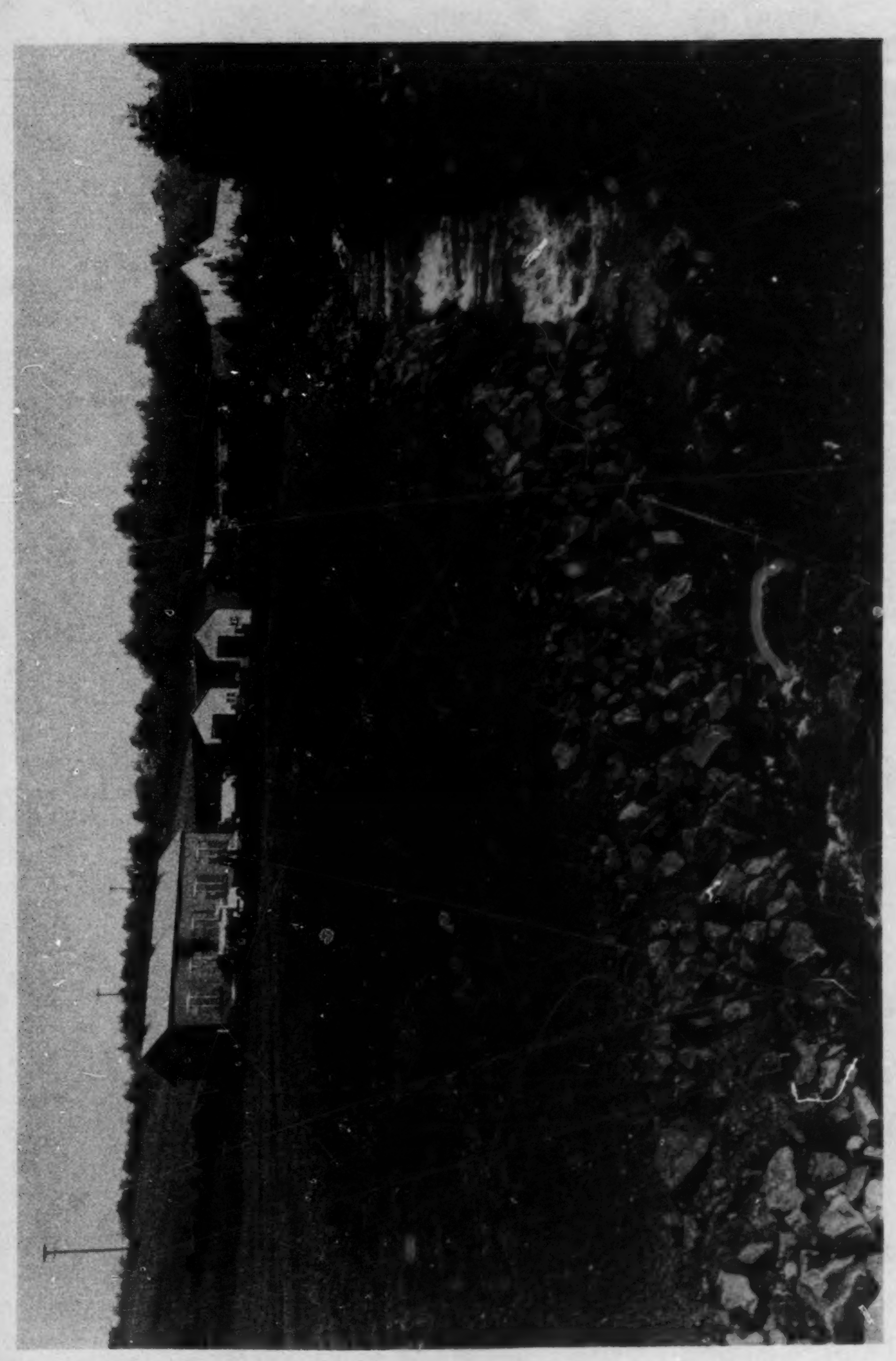






Mr. Gillman. Senator, I appreciate the opportunity to appear before you this afternoon and again appreciate your thoughts on letting me get out of here.

Senator Warner. Thank you very much. I will now defer to my colleague who has the oversight responsibility in the Congress for your particular department.

Mr. Wampler. I want to thank you for your statement and, at the outset, let me pay public tribute to one of our former associates, Mr. Baker, who served in the Soil Conservation Service, I think, for well over——

Mr. Gillman. Yes; Charles Baker.

Mr. Wampler. His knowledge of peculiar problems in the mining industry was vast and his advice, counsel, was welcome and he made a valuable contribution. I want you to know that.

You mentioned the site in Dante, and I assume that is in Russell County, where Russell and Dickenson come together. I have seen that site and my recollection is that that is refuse from a deep coal mine, isn't it? It is not connected with surface mining, is it?

Mr. Gillman. I assume it is from a deep mine.

Mr. Wampler. That is my recollection.

Mr. Gillman. I personally have not been on the site to see it.

Mr. Wampler. That is my recollection of it. It was in operation many years ago, and, of course, that was the accepted mining practice.

Mr. Gillman. Yes.

Mr. Wampler. Permitted to put the refuse in these large stacks.

Mr. Gillman. Yes.

Mr. Wampler. As one who has more than just a passing interest in the programs of the Soil Conservation Service, which is an agency of the Department of Agriculture, I want to say that I think this particular program is one that could be used wisely, and I hope we can get this question that the Internal Revenue Service has raised resolved as quickly as we can so people can participate in it. I think clearly the ruling of the Internal Revenue Service is contrary to the intent of Congress and this is not the first time this has happened. I hope we can get that matter clarified so we can proceed with the orderly implementation of the program.

I hope that you will be in a position to move forth, as funds are made available, in implementation of these applications.

Mr. Gillman. Thank you.

Senator Warner. We thank you. I am going to ask you to answer questions for the record which my counsel will pass to you as you leave. Thank you.

[Subsequent to the hearing Mr. Gillman supplied the following:]

United States
Department of
Agriculture

Soil
Conservation
Service

P.O. Box 2890
Washington, D.C.
20013

1981 OCT -6 PM 3:36

Honorable John W. Warner
United States Senate
Washington, D.C. 20510

Dear Senator Warner:

The enclosed information is submitted for the record in response to the written question presented to me at the Senate Committee on Energy and Natural Resources, Subcommittee on Energy and Mineral Resources hearing at Richlands, Virginia, September 2, 1981.

Sincerely,

Cletus J. Gillman

CLETUS J. GILLMAN
Deputy Chief for State
and Local Operations

Enclosure

Q. Your testimony has not been directed toward the past history of the implementation of the Rural Abandoned Mine Program (RAMP). Would you please provide this subcommittee with such information?

A. We are pleased to provide this information for the record. Rule promulgation, administrative, environmental and economic impact analysis, and developmental requirements were completed for RAMP on October 2, 1978. The Soil Conservation Service (SCS) publicized availability of the program in all the 29 States with eligible abandoned coal mined lands early in 1979. Acceptance of applications for assistance started March 1, 1979. Twenty-five hundred applications were received within 30 days. Because of the tremendous response, the application period was closed. Using an average cost of $100,000 per contract, 2,500 applications would require approximately $250,000,000. Potential funds for RAMP over the 15-year period (1978-1993) were expected to be approximately $500,000,000 to $600,000,000 based on appropriation of the full 20 percent of Abandoned Mine Land Funds authorized by law. In 1980, we started accepting additional high priority applications. However, no additional publicity or other solicitation efforts were, or are being, performed.

All applications received have been reviewed at the site to determine if they are eligible for RAMP assistance, their priority, whether the primary benefits accrue onsite or offsite, and to determine the applicant's ability to proceed. We currently have 2,876 valid applications for RAMP assistance on hand. They cover approximately 91,000 acres of abandoned coal lands. Fifty-four percent (1,562) are high priority applications.

SCS currently has an active program in all 20 of the States where valid applications were received. RAMP is carried out utilizing the existing SCS delivery system which is in place in all active RAMP counties. This delivery system takes advantage of a field staff, already in place, which is experienced in planning and implementing conservation and reclamation. The agency has over 40 years of experience in providing assistance to landowners and users in rural areas.

The program was designed to attain the maximum annual rate of reclamation of abandoned coal mine acres, possible at the 20 percent authorized funding level, by 1982. This level is considered to be the program operating level intended by Congress in the Act. The program goal is to achieve 98,000 acres of reclamation during the 15-year life of the abandoned mine land reclamation fund. By the end of FY 1981, approximately 223 contracts to reclaim about 4,700 acres will have been signed. At this rate, approximately 800 contracts to reclaim over 17,000 acres would be accomplished within the 15-year life of the fund.

The primary factors prohibiting implementation at the originally intended rate have been the tax problem (discussed in the testimony), funding level and inflation. The funding level to date has not reached the anticipated 20 percent level authorized by law. As of the end of FY 1982, the trust fund will have received approximately $681 million. SCS has received $35.5 million or 5.2 percent. At the 20 percent level, SCS could have received $136.2 million during this period. Implementation in FY 1982 will focus on servicing the 223 contracts already signed since RAMP is expected to be funded at the $4.3 million (2.2 percent) level. No new contracts will be signed.

Most of the existing contracts will have been completed by 1986 and if no new contracts are signed between 1981 and 1986 the program will be phased out. The 2,653 (92 percent) RAMP applicants remaining will be notified that they will need to request future reclamation assistance from the State reclamation agency (if the State has an active program) and the applications will be transferred to that agency. It should be noted that through State Reclamation Committees, consisting of all agencies involved in reclamation, the State agencies are aware of the RAMP applications on hand. Several applications are referred to OSM or the State agency when they are reviewed if the reclamation needed can best be handled by that agency.

Inflation is increasing the cost of reclamation in excess of 10 percent per year, thus reducing the number of acres that can be reclaimed with the funds appropriated.

The following table depicts a quick summary of implementation to date.

RURAL ABANDONED MINE PROGRAM
IMPLEMENTATION DATA
($ in Millions)

	1978	1979	1980	1981	82 Budget (Pending)
Program Funding ($)	5.0	10.1	10.1	10.3	4.3
Percent of Available Trust Funds	4.7%	5.5%	5.3%	5.2%	2.2%
Authorized Funds Not Appropriated for RAMP	16.1	26.8	28.2	29.7	35.7
Staff Years (PFT) Required	10	117	147	147	95
WORKLOAD:					
o New Contracts	0	63	74	86 est.	0
o Acres Contracted Cumulative	0	1,260	2,899	4,700 est.	4,700 est.
o Percent of Application Acres Under Contract	0%	1.4%	3.2%	5.2%	5.2%
o Number of Unserviced Applications	2,876	2,813	2,739	2,653	2,653

Senator WARNER. We will now return to panel B. We will have Mr. D. H. Harrold, chairman of the Virginia Coal Council; Mr. Goodpasture representing the Greater Bristol Area Chamber of Commerce; and Jack DePue, president of West Virginians for Work. I have just been told that John Kennedy, president of District 28, United Mine Workers, is unavailable.

Mr. Harrold, you are recognized as one of the deans. We will be delighted to have you open this panel.

Mr. HARROLD. Instead of attempting to summarize, I only have a double-page paper, and I have been known to expand a summary to several times the original product, so with your forgiveness——

Senator WARNER. I have witnessed that, but it has always been very substantive, sound, and unemotional.

STATEMENT OF D. H. HARROLD, CHAIRMAN, VIRGINIA COAL COUNCIL

Mr. HARROLD. The Virginia Coal Council is a volunteer diverse group dedicated to the betterment of Appalachian life through the expansion of markets for Appalachian coal which, of course, includes Virginia coal. We favor modification consistent with maintance of a healthful and pleasant environment, of any regulations which experiences has shown are an impediment to the economic development of coal and do not benefit the environment.

Most testimony in the past has concerned itself with the application of so-called "Strip Mine Law" to the stripping industry itself. The Virginia Coal Council would like to address itself to the inclusion of deep mining in the purview of the administration of the strip mining law. Most mining in Appalachia and especially in Virginia, West Virginia, and Kentucky is deep mining. The ratio in Virginia is 20 percent strip mining to 80 percent deep mined coal, 60 percent is produced by what are called "Truck Mines" producing on an average, less than 40,000 tons per year, but doing so very efficiently and employing miners who, in many cases because of age or physical condition, could not be employed by the large mines. To a large extent these truck mines mine coal reserves too small and too isolated to be mined by the large mining companies, thus extending the life of Virginia's coal reserves and contributing some $40 million in coal royalties to the land owners—many of them individuals of otherwise relative small means. Wages paid miners working in these truck mines in 1980 exceeded $120 million which does not include substantial profits made by the operators of these mines.

We thank Senator Warner and the committee members and staff for their presence and for their interest in our region and its single all-encompassing industry—coal mining in all its forms. If these are areas in which you can help us, we shall be most grateful.

Senator WARNER. We thank you very much, Mr. Harrold for this contribution, as well as the many others that you have made on behalf of those involved in the economy of coal.

We will now have Mr. Goodpasture.

STATEMENT OF FRANK GOODPASTURE, III, CHAIRMAN, BRISTOL COAL COMMITTEE

Mr. GOODPASTURE. Senator Warner and other members of the Subcommittee on Energy and Mineral Resources, on behalf of the Bristol Coal Committee and the Greater Bristol Area Chamber of Commerce, we welcome this opportunity to give testimony on the Surface Mining Control and Reclamation Act of 1977, Public Law 95-87.

The views and opinions herein are the general consensus of the leadership of the Bristol Coal Committeee and not the entire community of Bristol; however, we speak from a wide range of business and professional experience and feel that large numbers of people in Bristol and in the southern Appalachian region would find no difficulty in endorsing these views and opinions.

First let me say a few things about Bristol so that you can better understand our concern over the Surface Mining Act. Bristol is a city of about 50,000 people in two political subdivisions, one in Virginia and one in Tennessee. The main street is properly named State Street as its center is the State line. Bristol along with Johnson City and Kingsport, Tenn., constitute the Tri-Cities area which is the dominant population center of the 92d standard metropolitan statistical area. Bristol has no known coal reserves, but its closeness to the Appalachian coalfields creates an economic interdependence that has become increasingly important to both places. The residents and businesses in the coalfields depend on Bristol in varying degrees as a distribution point, trade center, health services center, and recreation area. Conversely, the various business and professional establishments in the city depend on the coalfields for large portions of their trade.

The coal mining counties in this tristate region represent the single largest retail and wholesale market outside the Bristol area. There are six major manufacturers and many smaller ones in and around the city that depend on the coal mining industry for all or the majority of their revenue. In regard to retail business, the Bristol Coal Committee conducted a sidewalk survey of shoppers at six locations during December of 1980. Of the shoppers interviewed, 63 percent were from out of town. Of that group 43 percent had a direct involvement with the coal mining industry. Further evidence of the importance of this market is the fact that the local newspaper, the Bristol Herald Courier, publishes a special daily edition for the coal producing counties. Additionally, the manager of the local GMAC Finance office, part of the finance organization of General Motors, states that 45 to 50 percent of the contracts handled by his office are a result of coalfield business. Likewise a local dentist says that 50 percent of his patients come from the coalfield area. Suffice it to say that the coalfield market is important in maintaining the commercial and professional establishment in Bristol as it is now known and will continue to be important in the future growth of the city.

Bristol feels the economic ripple effect when the coal market is up or when it is down. The Bristol Coal Committee wants to see a healthy and growing coal mining industry here in the southern Appalachians. The vitality of this industry can only be maintained if southern Appalachian coal can be competitive with foreign oil and coal from other regions. The Surface Mining Control and Reclamation Act of 1977 as it now stands does nothing to help the industry here to be competitive and in fact has made production more costly.

Any law that puts constraints on an industry is going to have its opponents and critics as well as its supporters and those that claim the law is not strict enough. The Surface Mining Act is no exception and the Bristol Coal Committee could best be described as a critic. As my group is representative mostly of merchants and not miners, we have chosen to limit our criticism to what we consider to be the most sailent and obvious short coming of the law * * * the original contour provision. We have no argument with strip mine reclamation per se, for we believe in responsible surface mining and reclamation. But returning the usable flat land that is resultant from surface mining to its useless original contour in an area such as southern Appalachia, can only be as foolish. It is as if Washington is playing a joke on us all.

Surely the intent of Congress, when passing this law, was to insure that the land would be protected as it was being mined and then reclaimed so that it could be productive after the mining was finished. Somehow the realities of this area were not dealt with when the original contour provision was written. Certainly there must have been a mistake made to produce a law that would so blantantly discriminate between coal mining in the East and that in the West. Western surface mine operators find it cost effective to comply with the law as it is written; however, many coal operators in our area have had to shift to deep mining or get out of the business due to the tremendous expense associated with reclaiming a mountainside to the original contour.

I have heard it said that the original contour provision was a compromise between those who wanted strip mining curtailed and those representing the industry who wanted no constraints. The story goes that the opponents of strip mining wanted all striping outlawed on slopes of 12° or more. The industry representatives opposed this citing the fact it would virtually outlaw all surface mining in the Appalachian region. The debate went on to the point where the opponents were steadfast at opposing strip mining on slopes above 20°. Industry representatives would not submit to this either and the original contour provision was agreed on as a compromise allowing for strip mining on any angle as long as the land was reclaimed to its natural slope.

If the original contour provision was indeed a compromise, then it is ironic because it really doesn't satisfy either party. From a technical standpoint it is harder to stabilize loose soil on a steep hillside when reclaiming to original contour, particularly with the rainfall that is typical of our region. The flat bench left after mining is much more stable and is in fact an aid in slowing water runoff in heavy rains. These two points trouble the stripping opponents and the added costs of original contour trouble the operators.

The coal industry is the lifeblood of the economy in this region. Surface mining is part of the industry because it is a viable technique in retrieving coal from the land. To the casual observer, strip mining is not a pretty sight. But if the flat land created by the mining process were left to be reclaimed for housing, pasture land, orchards, farming, or job producing businesses, then the sight could be quite beautiful.

Flat land comes at a premium in the southern Appalachian coalfields and it doesn't seem reasonable to hamstring an industry that produces as one of its byproducts * * * flat land. By leaving the Surface Mining Act as it is you are perpetuating the scarcity of this commodity.

The legacy of flat land left by surface mining prior to 1977 in Virginia reflects land usage from mountainous cultures the world over. In "flat land poor" areas such as Japan and China the people have terraced or made benches on their mountain sides for centuries. The Inca Indians terraced mountain land high in the Andes Mountains of South America and produced one of the foremost civilizations of this hemisphere. Engineers from the ancients to present day would scoff at the way the American Government is handling strip mine reclamation.

If the legislators could change the law to allow for bench areas to be left and utilized by the people who live here, it would do much to help the region. Appalachian coal could be mined cheaper, safer, be more competitive and more jobs would be produced. Flat land for development would be available for the housing that is so badly needed. Above all there would be usable land for the future to live on and to cultivate and develop once the coal is gone.

Senator WARNER. Thank you.

Mr. WAMPLER [presiding]. Senator Warner was necessarily called away from the hearing room to take a long distance telephone call. In his absence I am going to ask Mr. Jack DePue, president of the West Virginians for Work of Bridgeport, W. Va., to make his statement. Am I pronouncing it correct, DePue?

Mr. DEPUE. Yes.

Mr. WAMPLER. If you have a statement, Mr DePue, I am sure it will be entered in the record in its entirety, and if you wish to summarize or make additional comments, you are at liberty to do so.

Mr. DEPUE. Thank you.

STATEMENT OF JACK DePUE, PRESIDENT, WEST VIRGINIANS FOR WORK

Mr. DEPUE. My name is Jack DePue. I am president of West Virginians for Work. My comments today concern the implementation of the 1977 Surface Mine and Reclamation Act. Conceptually, the act was good; however in practical application, it has not been the valuable tool it was envisioned to be.

The coal mining industry is now being judged "guilty" of destroying the environment even before mining commences. This is not the way any person or other industry is judged in the United States, where you are innocent until proven guilty.

The act allows splinter groups and/or vocal minorities to discourage coal mining developments through harassing lawsuits and investigations. A classical example of this harassment involves the proposed Holly Grove Coal Co. mine located in Cannan, W. Va. This company applied in May 1979, for an NPDES permit from the EPA and a surface mine permit from West Virginia Department of Natural Resources. The State DNR permit was issued in March 1980, and Holly Grove began site preparation; roadbuilding, tipple site preparation, sidetrack construction, tipple construction, and sediment pond construction. A local group, FOLK (Friends of the Little Kanawha) filed suit against the EPA, Holly Grove, West Virginia DNR, and the Department of the Interior to stop the further development until the area was investigated for potential impact.

For over 1 year, I have been involved as a member of the Public Participation Committee for the Holly Grove EIS. This entire EIS effort by EPA has been a total waste of my time. Nothing new or revealing has come out of our committee meetings. The meetings instead have only served as a forum for the preservationists to gain publicity for their activities. The incredible thing with this whole process is, part of the funding for this group's activities comes from an EPA grant to study water quality and legal assistance from the West Virginia taxpayers through the Appalachian region defense fund.

Another area of concern deals with the enforcement of the act. The field inspectors view their role as a policeman, rather than one to help an operator solve particular problems. Whenever they inspect the jobsite, they feel they are compelled to write a violation. They will look for the most nit-pik things to write up.

An example of how they are misusing their role would be on the job where I work. We are preparing a mall site at the intersections of I-79 and U.S. Route 50 in Harrison County, W. Va. We have our proposed land use plan established with models, drawings and other descriptive plans; however, every new inspector is trying to force us to take the jobsite back to original contour. How can they do this? We are leveling a hill that was deep mined in the 1930's, and during the leveling process we have removed the remaining blocks and pillars of coal left from the deep mine. The removal of the coal and rock strata is necessary to prepare the mall site.

There are but two specific examples of how the implementation of the 1977 Surface Mine Act has been unnecessarily costly, discouraged industrial growth and technological innovation, and placed unnecessary regulatory burdens on the coal mining industry.

Thank you.

Mr. WAMPLER. Thank you, sir.

I want to thank all of the panel.

In the absence of Senator Warner, I will proceed with the hearing. I want to say especially to Mr. Goodpasture how much I appreciate your testimony. I guess I have to acknowledge a little bit of prejudice in this regard, since Frank Goodpasture has been a neighbor of mine in Bristol for most of his life. Even traveled with me in my campaign reelection efforts in 1974, and among his responsibilities was to drive the car, and I recall so well we arrived at a motel in Chilhowie, Va., about 3 in the morning, after having been out all day and most of the night, and were scheduled to get up at 6 and go to a furniture plant to shake hands with the workers as they went to work. As we got to the motel room, he said, "I am going to just sit in this chair, because it isn't worth getting undressed for 3 hours sleep."

I appreciate the contents of his statement.

Also, Mr. Harrold, we appreciate your being here and the good work you have done with the Virginia Coal Council. This is a group that I think has done much to emphasize the positive aspects of the coal industry and what it means to Virginia and our Nation, and we thank you and your organization for what you have done.

Mr. DePue, we appreciate your coming. These specific examples I think is what the committee wants to hear about and we appreciate it very much.

Mr. DEPUE. I have some additional testimony that I left at home, which I had misplaced, and I would like to mail it to you. It is in cookbook fashion of the rules and regulations.

Mr. WAMPLER. I am sure the committee would be glad to have it. If it is not in the hearing, it will certainly be in the committee files. I know they will appreciate having it.

Mr. DEPUE. Thank you.

Mr. WAMPLER. Thank you very much.

Mr. HARROLD. Thank you, Congressman.

Mr. WAMPLER. The next panel we have is panel D, Sister Adele Della Valle, Office of Appalachian Ministry of Wise, Va.; Sandra Williams, Virginia Citizens for Better Reclamation, Wise, Va.; and Stephen Smith, Appalachian Peoples Service Organization of Blacksburg, Va.

Also Mr. Rick Webb of Sutton, W. Va., was originally scheduled to be here, but it is my understanding he was unable to be present.

Sister, would you like to be the lead-off? If you would like to submit it, it will appear in its entirety and you may summarize it. However you care to do it.

STATEMENT OF SISTER ADELE DELLA VALLE ON BEHALF OF WALTER F. SULLIVAN, BISHOP OF RICHMOND

Sister VALLE. My name is Sister Adele Della Valle. I am a staff person of the Office of Appalachian Ministry of the Catholic Diocese of Richmond, and speaking today on behalf of Walter F. Sullivan, Bishop of Richmond, Va.

Coal is a basic element of life in southwest Virginia, and it is out of a fundamental concern for life that Bishop Sullivan submits these comments today. Coal, central to the economy of our area and a vital energy source in our Nation and throughout the world, is a God-given resource that sustains life. Coal mining is a life-sustaining process. However, when coal is mined in such a way that the gift of the Creator is not respected, coal mining can also destroy life.

Bishop Sullivan and the Diocese of Richmond have consistently advocated for responsible surface mining that respects people and the environment. We have spoken for persons powerless to address the adverse affects of irresponsible strip mining such as rock slides, mud slides, dust, blasting damage, stream sedimentation, or shattered water tables. We have also spoken for a holistic development of natural resources that safeguards land, minerals, air, and water.

In this connection we see the Surface Mining Control and Reclamation Act of 1977 as a piece of legislation enacted to protect life and respect resources as a gift of God. The law passed in 1977 should not be reopened or amended. Our concerns regarding its implementation in Virginia might however, necessitate modification of regulations.

Our comments today will focus on the following areas:

1. The 2-acre exemption;
2. The reorganization of the Office of Surface Mining;
3. Some aspects of the regulatory agenda at OSM; and
4. The approximate original contour provision of the act and its implementation in Virginia.

Mining operations disturbing 2 acres of land or less were exempted from the conditions of the Surface Mining Act, so that small scale commercial mining operations would not be unduly penalized. In 1977, there were very few 2-acre sites in Virginia. Our latest information from the Virginia Division of Mined Land Reclamation estimates 1,083 2-acre mines with 243 actively producing. Some of these mines have voluntarily acquired permits, but the vast majority are exempt from both State and Federal regulation.

The 2-acre exemption has led to several forms of abuse in Virginia, and if these conditions are not addressed they will continue to threaten public safety and the environment. Large mineral holders have circumvented the law by mining a succession of 2-acre mines in close proximity to each other. They have also leased out 2-acre tracts to independent operators; or created a series of separate corporations linked together by economic ties such as shared officers, equipment or employees.

The difficulties surrounding the 2-acre exemption in Virginia are compounded by a State law passed in 1979 which allows coal owners to "deed" their haul roads to county governments. Only three counties have issued a county ordinance putting this law into effect, but court house research shows that more than 250 miles of coal haul road, over 900 acres, have changed hands. It is often questionable whether these roads serve the public. The act of "deeding" reduces the total acreage of many sites qualifying them for the 2-acre exemption.

The intent of the Federal law is to protect small operators from complete and burdensome compliance. However, the 2-acre exemption was not intended as a loophole for large operators. If it is not addressed the damage from unregulated haul roads and unregulated 2-acre mines in Virginia will cause problems for years to come.

Even legitimate 2-acre jobs should be required to do some minimal reclamation. For example, sediment control, no spoil on the downslope, and compliance with blasting regulations seem essential.

A proposed final rule on the 2-acre exemption was withdrawn last month by the Office of Surface Mining. This proposed rule, which was 7 months in process, would have gone a long way to addressing the problems we have mentioned. In Virginia the 2-acre exemption presents an immediate and urgent problem. We urge an immediate revised rule, at least as strong as the withdrawn one, to safeguard life in all its aspects.

Our concern regarding the reorganization of the Office of Surface Mining centers around the planned reduction in inspection personnel. There are over 1,000 inspectable operations in Virginia, and only 5 assigned OSM inspectors. This arrangement will make it extremely difficult for OSM to monitor the enforcement of the State's permanent program. Our concern is that this proposed cutback will once again sacrifice land and people given Virginia's history of inadequate enforcement.

We would also like to comment on two aspects of OSM's regulatory agenda that seem likely to weaken the effectiveness of the 1977 legislation. One proposed ruling makes substantial changes in the requirements for the approval of a State program. The State window provision as originally designed was to provide flexibility in tailoring State permanent programs to local needs. Initital interpretation of the act allowed States to propose alternative regulatory techniques as long as they were "consistent with" Federal regulations. The proposed ruling requires only that a State's laws and regulations be as "effective as the act." This changes substantially the congressional intent that the Federal law and regulations "be the uniform minimum standard" for evaluating the adequacy of State proposals.

A second regulatory concern involves the proposed enforcement and inspection regulations. This proposed ruling serves to weaken in several places the right of citizen participation. The diocese of Richmond supports in every possible way the right of persons to influence decisions that affect their lives, and therefore questions these changes.

Finally, we would like to comment briefly on the requirement that mined lands be restored to their approximate original contour. We continue to support the AOC requirement on lands that have never been mined before. However, on second and subsequent cuts regulatory changes that relax these requirements might be in order. Such a proposed regulation should give careful consideration to environmental effects. We understand that such a change would not require an amendment of the act, and it is in this context that we support it.

On behalf of Bishop Walter F. Sullivan I would like to thank Senator Warner and the subcommittee for this opportunity to testify. As you consider the testimony offered today and at subsequent hearings we ask you once again to be mindful that the resources of the Earth are God's gift for all.

Senator WARNER [presiding]. We thank you very much for your very perceptive testimony. I witnessed the problem connected with this 2-acre exemption and the road situation being dedicated to the county system yesterday. I am glad that you raised it.

My apologies to this panel and the previous panel and the members in attendance for my absence for a minute or two. I had to put on my hat as a member of the Armed Services Committee. We have quite a problem in another part of the State that has developed unexpectedly. I may have to step out again momentarily to place some calls.

Mr. WAMPLER. I just want to compliment Sister Valle on the very fine precise statement and getting right to the point, and giving the committee a lot of areas that I think we need to look at and be concerned with.

On a personal note, I hope you will give Bishop Sullivan my best wishes. I recall being with him in Norton when we were breaking ground for the new St. Mary's Hospital. This has been some months ago. Also I don't think it was the same day, might have been, for the dedication and sanctification of the new church in Norton. He is a fine person and a dedicated theologian. If I remember correctly, southwest Virginia has not always been in the diocese of Virginia. At one time, I know Bristol was in the diocese of Wheeling, and I think they changed the jurisdiction of the diocese. Nonetheless, we feel very fortunate to have him as the presiding bishop over southwestern Virginia.

We appreciate your concern and the concern of the bishop. Let me assure you we will be looking at these areas.

Senator **Warner.** Mr. Harris, in his opening statement—did you have an opportunity to hear him or have you seen his statement?

Sister **Valle.** I did hear him.

Senator **Warner.** He indicated that he is going to work on this 2-acre problem that we saw firsthand yesterday. It is difficult. We will proceed with the next witness.

STATEMENT OF SANDRA E. WILLIAMS, COORDINATOR, VIRGINIA CITIZENS FOR BETTER RECLAMATION, INC.

Ms. **Williams.** I would like to ask if I could deviate from my written statement.

Senator **Warner.** You may. It is going to be put in the record in its entirety.

Ms. **Williams.** Well, Sister Della touched on three of our major concerns, the 2-acre exemption, which has been discussed today at length, and the ZBR, as far as ALC requirements in the act were touched on by her. Maybe I could expand a little bit on that, and then I would like to ask your permission, if time allows, to read a statement from the mayor of St. Charles, Virginia, a community that has been affected not only by surface mining, but by implementation of the Federal law as far as measures that have been taken by OSM to alleviate some of those problems.

Senator **Warner.** We will grant you that right.

Ms. **Williams.** As I said, the Virginia Citizens for Better Reclamation favor a relaxation of ALC regulations on previously mined lands within certain guidelines. We have taken this position not because we believe there is a great need for flat land in the coalfields; we believe there is a need, but we don't believe in the past that surface mined land has provided that need.

We have over 70,000 acres of surface mined land and very little of that has been used for development. Most of the land is in remote areas that can't be used for development.

So we support a relaxation of the regulations on previously mined land, not because of the great need for flat land, but because it does not seem realistic or desirable to require operators to attempt to retrieve spoil from the downslope on previously mined areas or to haul in additional material to completely eliminate an existing high wall.

I would like to add emphatically, however, that we support relaxation of these requirements only upon previously mined areas, which we understand will be where approximately 80 percent of the surface mining in Virginia will take place. We do not support relaxation of those requirements on virgin land, nor do we support relaxation of the procedure or requirements for obtaining a variance from AOC requirements.

I will just go to James Mooneyhan, who is the mayor of Saint Charles. I would like to present his statement now.

[The prepared statements of Ms. Williams and Mr. Mooneyhan follow:]

STATEMENT OF

SANDRA E. WILLIAMS
COORDINATOR
VIRGINIA CITIZENS FOR BETTER RECLAMTION, INC.

BEFORE THE SUBCOMMITTEE ON ENERGY
AND MINERAL RESOURCES, COMMITTEE ON
ENERGY AND NATURAL RESOURCES

September 2, 1981

My name is Sandra Williams. I am from Wise County and I have long been concerned with the adverse effects of poorly controlled strip mining. I am here today to speak on behalf of Virginia Citizens for Better Reclamation. Our organization has approximately 200 members, most of whom are from the coalfields of Virginia. While not everyone in our organization has experienced problems resulting from surface mining conducted near their homes, most of the members who make up the core of the organization have. That is why our organization is primarily concerned with seeking laws and regulations which will protect the property rights of citizens living near surface mines and which will minimize the adverse environmental effects of surface mining. VCBR members consider coal production to be of vital importance to coalfield economies, but we want the lives, property rights and environment of coalfield residents given consideration when decisions are made regarding how that coal is to be produced.

Our group has worked since 1976, at the state and federal levels, to help design and implement strong surface mining control and reclamation standards. During that period we have come to realize that it will take time for Virginia's strip mining industry to adjust to additional mining requirements, especially those dealing with spoil placement. By the same token, we also realize that it has taken, and will take, time for the Federal Surface Mining Act to be fully and properly implemented.

We do not want to see the Act opened for amendment until it has been fully implemented and given time to work. The various extension periods for program submittals, regulatory rule changes, court suits and injunctions have obviously caused confusion for everyone involved: the regulatory agencies, coal operators, and citizens. During this climate of uncertainty and confusion we believe it would be counterproductive to amend a law which has not been finalized even so far as having permanent regulatory programs adopted and implemented in all coal producing states. It is VCBR's belief that the Office of Surface Mining, under its new directors, will relax, if not delete many regulations considered burdensome by the industry, so that modifications of the Act will not be necessary until a much later date. At that time the industry, OSM, citizen groups, and Congress can intelligently evaluate the Act and proceed accordingly.

An example of an issue which we have long recognized as a problem area, which is being addressed by OSM, is the requirement of returning the land to approximate original contour and highwall elimination on previously mined areas. In March of this year, our organization stated our desire to see OSM relax the highwall elimination requirement on previously mined lands under specific guidelines. We were assured that OSM could, by regulation, allow this deviation, and, in fact, OSM has since issued proposed regulations on this subject. VCBR took this position not becuase we believe there is a great need for flat land in the coalfields - we already have more than 70,000 acres of previously mined "flat land" which should supply our needs for years to come - but because it does not seem realistic or desirable to require operators to attempt to retrieve spoil from the downslope on previously mined areas, or to haul in additional material to completely eliminate the highwall.

I would like to add emphatically, however, that we support relaxation of these requirements, only upon previously mined areas, which, we understand, will be where approximately 80% of the mining in Virginia will take place; we do not support relaxation of those requirements on virgin land.

Nor do we support relaxation of the procedure or requirements for obtaining a variance from AOC requirements. We believe that the problems said to be associated with obtaining variances have been exaggerated by opponents of the federal law in Virginia. I say this because this procedure has yet to be tested in this state; for, as you know, the permanent program has not been implemented here. The argument for strip mined flat land in remote sections of the coalfields was examined and rejected by the U. S. Supreme Court in their 9 to 0 decision upholding the constitutionality of the AOC requirements in the Act. It is a simple fact that surface mine sites that can realistically qualify for development are few and far between; we believe the variances allowed under the Act for those sites are reasonable. Once the final regulations concerning development of these sites are issued and the permanent program goes into effect in Virginia, this major concern of the industry should be alleviated.

There is another area of concern to us, which we believe can also be handled by the regulatory process and does not require amendment of the Act. That is the loophole in federal regulations which has allowed large companies to mine numerous two acre tracts and escape jurisdiction of the federal law.

As you know, when the Federal Surface Mining Control and Reclamation Act, was passed in 1977, mining operations which disturbed two acres of land or less were exempted from the law. The legislative history of the Act reveals that the intent was to give an economic break to small operations, mining coal for small scale commercial use.[1] At that time, only four or five mine sites in Virginia qualified as being two acres or less.[2] Although, understandably, accurate figures are hard to come by, as of June, 1981, the Office of Surface Mining had a list of approximately 430 strip and deep mines in Virginia claiming this two acre exemption; OSM officials caution that the list is far from complete. The Virginia Division of Mined Land Reclamation (DMLR), estimates that since 1979 nearly 1100 two acre sites have been mined in Virginia.[3] Most of those mines are exempt from both state and federal regulation. According to DMLR, however, approximately 157 of these operations have, or had, permits voluntarily acquired from the state, which subject them to the Virginia surface mine law and regulations passed prior to the Federal Act. As of June, 1981, DMLR estimates there were 243 actively producing sites in the state.

The federal exemption was probably an invitation for abuse from the outset, but this loophole was exacerbated by passage of two pieces of legislation, in 1979, by the Virginia General Assembly. The first was a bill which removed mines of two acres from regulation by the state; until then, the state had regulated all surface mines in Virginia, regardless of size.[4] The second was a bill which allowed coal companies to "deed" their haul roads to county governments, thereby removing those roads from regulation by state or federal agencies, and their owners from all responsibility for proper construction or maintenance, and, at the same time, reducing the total acreage of many mine sites to under two acres.[5] These two pieces of legislation, although the source of two separate problems in one sense, are complimentary, and it is hard to consider either alone. The problem caused by the two acre exemption, for example, cannot be adequately understood without a discussion of the haul road problem.

Although only three counties have taken advantage of the haul road provision-Russell, Dickenson, and Buchanan - in the two years since that provision went into effect, more than 250 miles of coal haul roads, over 900 acres, have been deeded to those counties.[6]

An examination of road deeds in the county courthouses shows the extent to which large coal companies have taken advantage of this provision. As of the spring of 1981, 190 road deeds had been executed. Buchanan County had the distinction of having both the highest incidence of deeded roads, and mines operating under the two acre exemption.[7] One individual from West Virginia, granted over thirty road deeds to Buchanan County under four different company names in a single day. Still another major coal corporation, Pittston, was responsible for over half of the road deeds executed in Russell and Dickenson Counties.[8]

These roads appear to be public in name only. They often go long distances in isolated terrain and few serve any facility other than the mine site. Most of these roads are impassable except by coal trucks or four wheel drive vehicles. In one documented instance, Clinchfield Coal Company, a subsidiary of Pittston, installed a lock on the gate at the entrance of one of these so called public roads.[9] This not only prevented use by the general public, but necessitated access keys for state and federal inspectors, if they were to inspect the mine which lay beyond.

The responsibility for maintenance of these roads is unclear. In Buchanan County, where 60% of the deeding occurs, the road ordinance clearly states that acquisition and maintenance of the roads be at no cost to the county. The Office of Surface Mining administrative law judges ruled, however, that a continuous and significant expenditure of public funds for upkeep is necessary for these roads to escape jurisdiction under the Federal Act. The Office of Surface Mining's acting director in Virginia, Doug Stone, says that federal inspectors are proceeding as if the haul roads had not been deeded to the counties. The DMLR, however, is honoring these deeds and does not require companies to construct and maintain them according to regulations; nor does it include these roads in calculating the size of the mine.

The effect of this split in state and federal enforcement can be illustrated by the case of one Buchanan County resident who lives about 100 yards from a less than two acre deep mine. The haul road for this mine has been deeded to the county. The complainant told me that he had lived next to this active deep mine since 1975 and had never experienced a problem until May, 1979. At that time he began to have problems: black dust from the coal bin or hopper covered his house; orange water began seeping onto his property from underground sources; black material (breeze) created dust and mud on the road; and black water and sediment was discharged into a nearby river where he likes to fish. Before he called the Division of Mined Land Reclamation he contacted the State Water Control Board, the EPA, and the state game commission; nothing was done to correct the problem. In Febrauary, 1980, a DMLR inspector investigated the complaint and noted that DMLR had no jurisdiction because the mine was under two acres, with a haul road deeded to the county. (The complainant maintains that a portion of the haul road, deeded to the county in March of 1979, belongs to him.) Nearly a year ago the man complained to DMLR again and he was told by the inspector that he should contact OSM. He did so. Thus, over two years after the problem began, OSM is finally taking action against the company.[10]

It is clear that coal companies, left to keep up roads without federal or state regulation, often conduct minimal maintenance and many roads are in undeniably bad shape. One such road in Buchanan County was described in an OSM report on two acre mine sites as follows:

> An access road had been constructed up to this bench approximately 2,700 feet long, some of which was reconstructed old bench; but a large portion was newly constructed. Spoil, rocks and trees had been pushed downslope along this road cut. Seepage from the cuts and highwall at the faceup was flowing uncontrolled through the loose material, causing sliding in several areas. Blasting was being conducted along this access road.....Surface drainage for the entire disturbance was not controlled.[11]

An administrative law judge described a similar road, again in Buchanan County, as a "hog wallow".[12]

The situation in Buchanan County not only exposes the practice of deeding these roads to the county as a sham to circumvent the Federal Act, but, as the above example illustrates, reveals the potential for significant environmental harm as well. According to an EPA document, coal haul roads "are a major source of sediment and can result in rates of erosion in the range of 2,000 times that of unmined watersheds".[13] Even properly constructed and maintained haul roads contribute heavily to stream sedimentation through runoff. One can only imagine the amount of stream sedimentation caused by approximately 900 acres of poorly constructed and maintained roads.

Unregulated haul roads pose a serious environmental problem. And, as mentioned earlier, in addition, the practice of deeding haul roads to counties worsens the two acre exemption problem; for, exclusion of haul roads from acreage calculations is critical to claiming most two acre exemptions. By mining a number of related two acre sites, subleasing two acre sites to independant contractors, mining successive two acre segments and deeding haul roads to counties, large mining companies and mineral owners have circumvented an exemption intended for small mining operations. Haul road deeding is such an integral part of claiming an exemption that without it about 40% of the documented exempt mines in Virginia would not qualify for the two acre exemption. The list compiled by the Office of Surface Mining shows that out of 436 mines claiming a two acre exemption, over 180 have deeded their haul roads to the county.

Among other practices which are used to circumvent the law in Virginia is the practice of mining a series of mines, less than two acres, all within close proximity to each other, and claiming the two acre exemption. An example of this practice exists only a few miles from my home. There, two plumbers with a bulldozer have mined, at last count, five two acre sites within 1/2 mile of each other. There is spoil on the downslope, no drainage control, mining carried out within a few feet of three occupied dwellings, and there has been no reclamation of the disturbed areas. In short, they have nearly devastated this small hollow.

Another practice used to circumvent the law is for large mineral owners to lease two acre tracts to independent contractors. This was the situation in the citizen's complaint referred to previously. There, Jewell Smokeless Corporation, leased the two acre site to an independent contractor. According to the inspector's report Jewell Smokeless takes care of all outside reclamation work, road maintenance, and the road engineering work. All coal is sold to Jewell Smokeless (See Appendix A)

Finally, there is the problem presented by shell corporations which claim a two acre exemption. In that situation, several different companies mine a number of related sites yet share officers, mine equipment and employees. An example of this problem occurred recently in Buchanan County where five different companies mining in the same area had the same operator and each company claimed a two acre exemption. The operator also claimed the haul road had been deeded to the county. That turned out not to be the case, and thus all of these mines were brought under the state's jurisdiction.[14]

In addition to the abuse of the two acre exemption made possible by deeding coal haul roads to county governments, and leasing and mining successive two acre tracts, another aspect of the two acre exemption problem is that of wildcat operations. The two acre exemption has been a godsend to wildcat operators. They can claim a two acre exemption even if they intend to mine twenty; for, the two acre exemption puts the burden of proof on the regulatory agency. And by the time the regulatory agency gets around to surveying the property and dragging the operator into court, the operator has very likely finished mining. If he hasn't, and is taken to court by DMLR, he probably won't be convicted. (A review of DMLR's court cases regarding actions taken against operators mining without a permit, shows that of 31 cases since 1979, there have been only 11 convictions.) And if the operator is convicted, his fine, if any isn't likely to be more than $500.00 - that was the highest fine noted in the DMLR records. More likely, however, he will be given sixty days to obtain a permit, an order, it appears, that he can ignore with impunity. In some cases the judge will issue an injunction prohibiting the operator from mining without a permit, but by the time that happens the damage has been done. (See appendix B, for instance.)

Figures provided by the Division of Mined Land Reclamation show that only a little over one percent of the unpermitted mines claiming the two acre exemption do even minimal reclamation; twenty percent of the citizen complaints at DMLR in 1980, concerned two acre mines. The environmental and property damage caused by the two acre mines will not easily be corrected. At the present time neither OSM nor DMLR has jurisdiction over those abandoned unpermitted sites. The land, left unclaimed, will continue to cause problems for years to come.

Virginia could close the loophole which allows large companies to claim the exemption unfairly. So far, it hasn't. And, unfortunately, the proposed laws and regulations concerning the two acre exemption and haulroads in the recently resubmitted Virginia Permanent Program are not only inadequate to close the loophole, but actually seem to reinforce it. For instance, Sec. 45.1 - 273 of the proposed Virginia legislation states that roads maintained with public funds and coal haul roads established pursuant to Sec. 33.1 - 246.1 of the Code shall not be considered in calculating the total acreage affected by an operation.

OSM can close the loophole in its own regulations. It hasn't so far. In fact OSM recently dropped a proposed rule which VCBR believed would have corrected the problem. In commenting upon the rule withdrawal, OSM stated its intention to address the "important 'related sites' issue and the complex issues involved in counting haul roads and access roads as part of a mine" in a revised two acre exemption regulation. We hope they will do so soon, for the two acre problem in Virginia seems to worsen daily.

Finally, VCBR has a major concern regarding the impact the change in the OSM inspection divison will have on enforcement of the Act in Virginia under the permanent program. The establishment of one state office and the elimination of district and field offices, under Secretary Watt's reorganization plan, coupled with the cutback in inspectors from 11 to 5, will severely impede OSM's ability to see that the act is enforced in our state.

According to the Office of Surface Mining in Lebanon, OSM has between 1100 and 1200 inspectable units in Virginia. That works out to about 240 units per inspector. With that in mind, it is hard to understand how these inspectors will be able to respond to citizen complaints, let alone carry out other oversight duties set out in the federal regulations. It will be particularly hard for them with the one state office located in Big Stone Gap, Virginia, which is on the edge of the coalfields. They will have to travel 2 or 2 1/2 hours from Big Stone Gap to reach mines in Buchanan County, where much of the state's coal is produced.

We were recently assured by OSM deputy director, Steven Griles, that if one state office proves to be inadequate, a field office will be established. We are still concerned, however. Virginia has had a history of weak and uneven state enforcement of surface mining laws. We need a strong, effective OSM presence in the state to strictly monitor that enforcement when the permanent program goes into effect. (See editorial, appendix D.)

Footnotes

1. Senate Report No. 95-128, 95th Congress, 1st. Session 98 (1977).
2. Interview with Dan Stocker, District Director, Office of Surface Mining, Lebanon, Virginia.
3. Interview with Mike Abbott, Public Information Officer, Division of Mined Land Reclamation (DMLR), Big Stone Gap, Virginia.
4. Virginia Code Section 45.1-253
5. Virginia Code Section 33.1-246.1
6. Deed Books, Buchanan, Russell, and Dickenson Counties, February, 1981.
7. Deed Book, Buchanan County; "OSM List of Two Acre Mines in Virginia".
8. Deed Books, Russell and Dickenson Counties, February, 1981.
9. Division of Mined Land Reclamation, Inspection Report, December 1, 1980, Clinchfield Coal Company, Permit #1578.
10. DMLR Citizen Complaint File, OSM Inspection Report, Shannon Coal Company.
11. "Two Acre Mine Situations", June 4, 1980, Case Number One, Commonwealth Resources, Inc., Buchanan County, Virginia, Office of Surface Mining, Richlands, Virginia.
12. Lambert Coal Company v Office of Surface Mining, September 16, 1980, Office of Hearings and Appeals, U.S. Department of the Interior.
13. Erosion and Sediment Control, Surface Mining in the Eastern U.S., Vol. 1, October, 1976 (EPA - 625/3-176-006 at p. 71.
14. Division of Mined Land Reclamation, Court Cases, Ledger A & B, Wayne Coal Company, Contrary Mining Company, Mossey Creek Mining, J & B Coal Company, Samson Mining Company.

VA-RICH-02-81

(Appendix A)

United States Department of the Interior

OFFICE OF SURFACE MINING
Reclamation and Enforcement
Richlands Field Office
Post Office Drawer 400
Richlands, VA 24641
February 13, 1981

COMPLAINT INVESTIGATION REPORT

On January 22, 1981, our office received a complaint against Shannon Coal Company of Swords Creek, Virginia. The complaint involved an active deep mine operation located off State Route 628 near Pilgrims Knob, Virginia; and was for black water from the minesite leaving sediment on the complainant's property and causing a buildup of ice on the road making travel difficult.

On February 2, 1981, OSM Supervisor Willis Wagner and Inspector Bill Arnett met with the complainant and observed some sediment in his yard beside the house and in the field behind the house. Due to snow cover, the extent of the sediment was not determined. The minesite is located above the property. No discharges from the minesite were observed flowing onto the property today. Surface drainage was flowing down the road in front of the house, which is used as the access and haul road for the mine operation. Some of this drainage was coming from the minesite coal loading area. Water sample #73-2-2-81-1 was collected where this surface drainage flowed off the road surface and entered the diversion ditch. According to the complainant, about a week before Jewell Smokeless had graded the road and then surfaced the road with 'breeze', a coke material. This had been done after a VDMLR inspector had talked to company officials. The state inspector had not taken enforcement action due to this minesite having a less than two acre permit. We next conducted an inspection of the mine operation.

Upon entering the minesite, we met Garnet Ray, Superintendent of Shannon Coal Company, and presented identification and intention to conduct an inspection. Steve Harold, Chief Engineer for Jewell Smokeless Coal Corporation and Mr. Massey, an attorney for Jewell Smokeless, were also present.

This minesite had been permitted on January 25, 1979 by Jewell Smokeless Coal Corporation for 2.94 acres to mine the Jawbone Seam. The mine had been started prior to May 3, 1978. On March 23, 1979, the access and haul road had been deeded to Buchanan County, Virginia. An amendment on April 13, 1979 deleted the road (.76 acre) and an error in calculations (.69 acre) to leave a total of 1.49 acres. According to a letter, these calculations had been made with a planimeter. The mine license is under Shannon Coal Company, Federal ID #44-02238. According to Mr. Ray, Jewell Smokeless takes care of all outside reclamation work, road maintenance and the engineering work. All coal is sold to Jewell Smokeless.

The minesite consists of a large upper bench and a small lower bench where coal is loaded from a tipple. Surface drainage is directed from the middle section of the upper bench to two small sediment basins located on the lower bench. No sediment control is provided for the fan area on the far end of the bench. The west end of the upper bench where the mine office is located had no sediment control although there appeared to have been a pond here at one time. A discharge was coming from the end portal and flowing across the edge of the minesite into a field below. Water sample #73-2-2-81-2 was collected where this discharge left the disturbed area.

The coal loading bench has a pond on the east side which receives drainage from the upper bench via a diversion ditch. The discharge was turbid and water sample #73-2-2-81-3 was collected. This discharge flows down the bank into the road ditchline. A second small basin is located on the west side and receives some drainage from under the tipple and some from the upper bench. The remainder of the lower bench did not have sediment control and a black discharge from this area was sampled (#73-2-2-81-4).

We observed that three areas along the access and haul road needed surfacing. One area was from the coal loading area down to the sharp turn in front of the first house. The beginning of the road at State Route 628 also needed surfacing as well as an area in the first section of road where a culvert is located. In this third area, much sediment had collected in the ditchline.

On February 9, 1981 I met with Steve Herald and Barbara Farmer, and discussed the status of the minesite. According to Ms Farmer, the minesite acreage of 1.49 acres had been calculated as a combination of planimeter and survey; and the amount of road actually being used would bring the total to two acres or less. Ms Farmer further stated that the mine would be permitted under Shannon Coal Company for the permanent program. I then served to Mr. Herald NOV #81-I-73-2 and explained the violations and rights of appeal. This NOV contained three violations: 1) Sediment ponds, 2) Haulroad surfacing and 3) Effluent for total suspended solids. Mr. Herald and Ms Farmer both felt Shannon Coal Company alone should be cited on the NOV. I had earlier explained the violations to Mr. Ray and left a copy with him. This concluded the investigation.

Bill Arnett
BILL ARNETT/#73
Reclamation Specialist

Family says mine operation spoils water

By PAT PRICE
Lee County Bureau

PENNINGTON GAP — Most mornings the Burgans rise to the hum of a generator at the wildcat mining operation across the road from their home on Harbor Hill.

Most evenings the Burgans draw the curtains on the wildcatters' lights in the night beyond their window.

Most weeks Cecilia and Mary Burgan gather milk jugs and drive fifteen miles to Dryden for water.

Last year the well dried up. What little water Mary Burgan drew from her well showed up a bright reddish-orange in her small pail — the burnt tones of the pond across the road. "It looked like grease on top," she said.

The well water is clear now, but there is not enough water for the two families. Cecilia married Mary's son Elmer. The couple and their four children live below Mary and her husband George.

The Burgans don't drink the well water now. "It has a funny taste," Mary said.

Cecilia's children hid under the family's blue pick-up truck last summer to dodge the fly-rock from blasting on Harbor Hill.

Mary talked to the one of the operators at P&M Coal Company once. Last year Larry Mullins came to see her. "He came here and asked if he was doing something to the water, and I told him he sure was," Mary said angrily. "After that he never did talk to me anymore."

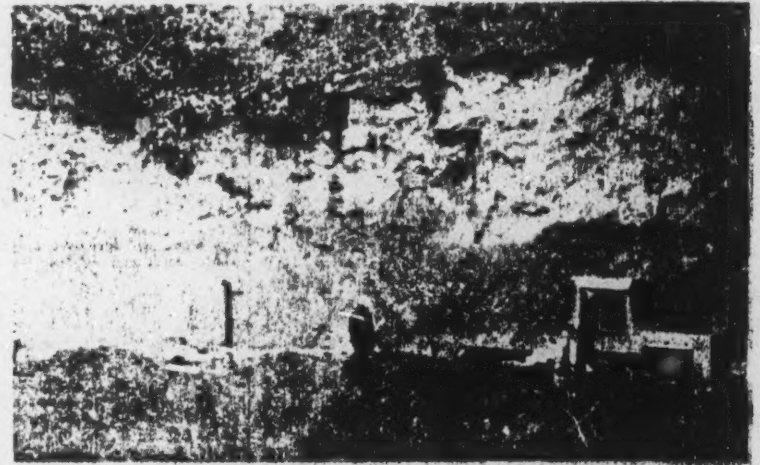
Cecilia says the company started on the old deep-mine site during the fall of 1979. "They done a lot of stripping and got a lot of coal out before they started in on their deep-mine," Mary added.

The Burgans have watched the strippers shut down before the inspectors drove up. "Oh, they'd find ways to dodge them, they'd leave before the inspectors came," Mary explained.

Mary and Cecilia Burgan have given up. "Well I'll tell you this," Mary said. "You hear of things like that being turned down so much, it does want to make you back down. There's nothing they can do about it."

"Most of the time when you stand up for your rights, you find out you can't. You get knocked back off your rights," Cecilia said softly.

But the Division of Mined Land Reclamation will soon be dragging the company to court for the third time. They have not given up.



Times-News photo — Earl Carter

The 3.6-acre mining operation will soon be dragged into court for the third time by the Division of Mined Land Reclamation.

DMLR argues the 3.6-acre operation does not fall under the two-acre exemption in the Federal Surface Mining and Control Act of 1977. This exemption allows companies to bypass the permitting process if the disturbance is two acres or less. Operators are immune from federal and state laws.

The attorney general's office has given DMLR the go-ahead to seek an injunction enjoining P&M from mining until an approved permit is issued, according to Mike Abbott, DMLR's

More on page 2A, col. 3

Continued from page 1

[illegible] information officer.

P&M was found guilty of mining without a permit, and fined [illegible] in Lee County General District Court last August. But [illegible] Mullins appealed the conviction to Lee County Circuit Court in [illegible] a jury [illegible] returned [illegible] of the [illegible] court.

[illegible] the case was [illegible] because [illegible]

[illegible] Larry Mullins and his [illegible] Jim Poteet say they [illegible] just trying to make an hon[illegible]

"The word I get is they're [illegible] to get an injunction to [illegible], and [illegible] mine?" [illegible] won't [illegible]

[illegible] oper[illegible] and [illegible] permit application [illegible] last May. [illegible] application was returned to the company in July [illegible] correction. Mullins says he [illegible] the application in [illegible]ember, and has heard nothing from DMLR.

The problems on Harbor Hill are problems of interpretation by Mullins and Poteet. They say there are three separate operations there, each falling under the two-acre exemption.

Two of the adjacent operations are leased by P&M from B&E Coal Company, operated [illegible] by Ralph Baker.

"Those reclamation people put both of them together and say it is 2.6 acres," Mullins said.

B&E also has a separate adjacent tract on which Mullins and Poteet are opening a deep-mine. Mullins says there is no contract between the two companies for this third operation. They have a verbal agreement.

Both men say they did nothing to the Burgans' water supply. "How could we affect the water supply," Mullins said angrily. "Their well is [illegible] feet below where we were. We only went down fifteen feet after the coal."

"That is just an opportunity to blame it on the strip-job, blame the strip-job for the drought," Mullins asserted.

DMLR decided it would be difficult to prove the company affected the Burgans' water from the time the blasting started in 1979 and the time the complaint was filed last summer.

Mullins and Poteet believe they are helping people in the area, adding that there has been no stripping on Harbor Hill since December 1979.

"People are raising hell about us stripping," Mullins said. "That place was nothing but a swamp, a mosquito bed. We want to turn it into some useful property, a trailer court. And we're harming the environment?"

Virginia Citizens for Better Reclamation believes the company is harming the environment. They filed a complaint last summer on the Burgans' behalf on blasting violations.

"The abuses on the site bring us back to the abuses during pre-federal law days," VCBR director Pat Greene said. Among the violations she noticed on her visit to the site were mining too close to a public road, a topsoil marker on a spoil pile, and drainage problems.

Greene estimates at least 400 operations claim the two-acre exemption in Southwest Virginia. Most of the problems are in Dickenson and Buchannon counties, she said. Abuses are not uncommon.

The two-acre exemption was intended to help homeowners dig coal from outcrops in their back yard. But that is not how it has been used.

Large companies often sublease to smaller operations and buy the coal back.

Haul roads are often deeded to the county to reduce the company's acreage.

"The haul road is as much a disturbance as the mine site," Greene said. "The spoil is on the down-slope. And that was thought to be a thing of the past with the enactment of the federal law."

Greene says an estimated 90 percent of the two-acre mine sites in Buchanan County qualify by deeding the haul roads back to the county. Cost to the county for maintaining those haul roads is estimated to be $75 every one-tenth mile.

"What good was th[illegible] land before?" Mullins quizzed as he poured a round of coffee for the four of us at the Driftwood Drive-in. "I believe in reclamation, in reseeding, in planting trees, but there's a limit to everything."

"You tear a little bit up, but then you smooth it back," Poteet added.

Mullins might say he [illegible] trying to smooth [illegible] division [illegible] lost almost [illegible] the [illegible] [illegible] was [illegible] coal [illegible] since [illegible]

The two [illegible] a loader and [illegible] they couldn't afford to [illegible] payments [illegible]

[illegible] call [illegible] ned [illegible] covered and water [illegible] on it. We [illegible]

The [illegible] began [illegible] again on Harbor Hill last year only after the permit application was submitted, Mullins says.

Mullins and Poteet say they are just tryin[illegible] make an honest living.

The Burgans settled on Harbor Hill before the miners.

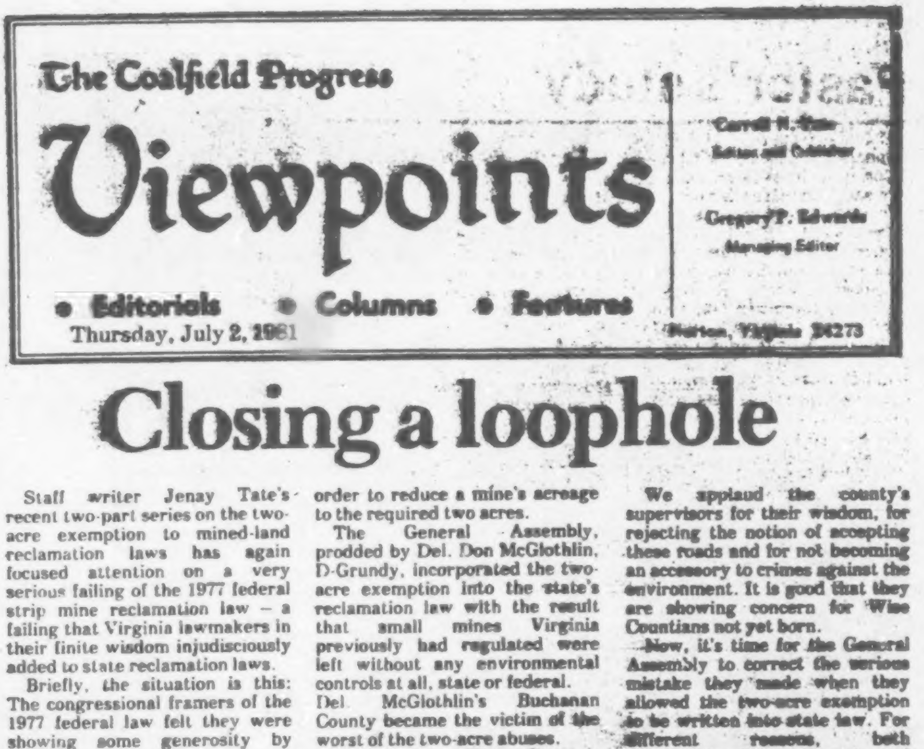
George Burgan is 77 years old and mined coal for forty years in Harlan County, Kentucky until he and his wife moved to Harbor Hill in 1955. In the early sixties he signed up for black lung benefits, and threw away his hearing aids.

Mary says he doesn't understand anything that is said to him. What he knows he keeps to himself.

There is little light in the front room facing the wildcat site, and George Burgan sits quietly in the armchair beside the window.

Most evenings the Burgans draw the curtains on the strippers' lights in the night beside their window.

(Appendix C)



The Coalfield Progress

Viewpoints

• Editorials • Columns • Features

Thursday, July 2, 1981

Carroll N. [illegible]
Editor and Publisher

Gregory P. Edwards
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Norton, Virginia 24273

Closing a loophole

Staff writer Jenay Tate's recent two-part series on the two-acre exemption to mined-land reclamation laws has again focused attention on a very serious failing of the 1977 federal strip mine reclamation law – a failing that Virginia lawmakers in their finite wisdom injudisciously added to state reclamation laws.

Briefly, the situation is this: The congressional framers of the 1977 federal law felt they were showing some generosity by providing an exemption in the federal law that would permit the mining of coal for family use and by small commercial operations. The end result of their good will, however, was a serious loophole in the federal law that allows large corporations to scatter two-acre operations all over a hillside in the names of subcontractors. Several counties have aided and abetted circumvention of the reclamation laws by allowing coal companies to deed their haul roads temporarily to the public in order to reduce a mine's acreage to the required two acres.

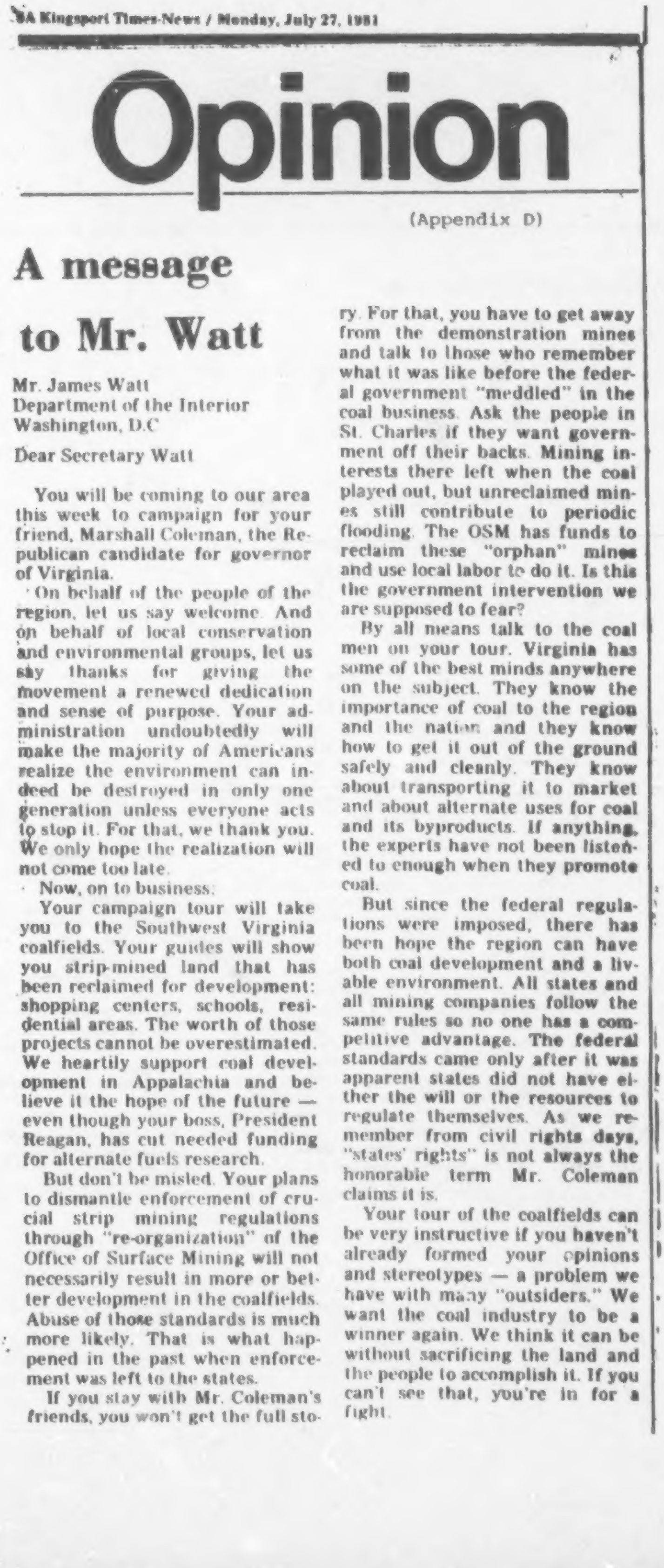
The General Assembly, prodded by Del. Don McGlothlin, D-Grundy, incorporated the two-acre exemption into the state's reclamation law with the result that small mines Virginia previously had regulated were left without any environmental controls at all, state or federal. Del McGlothlin's Buchanan County became the victim of the worst of the two-acre abuses.

Fortunately, Wise County's Board of Supervisors has never agreed to accept coal haul roads into a county system. Unless a county becomes such an accessory it is nearly impossible for serious two-acre abuses to occur since haul road acreage is included in the determination of eligibility for the two-acre loophole. Pittston Coal Group approached the county board about accepting coal haul roads but the present and previous boards have never been warm to such an idea.

We applaud the county's supervisors for their wisdom, for rejecting the notion of accepting these roads and for not becoming an accessory to crimes against the environment. It is good that they are showing concern for Wise Countians not yet born.

Now, it's time for the General Assembly to correct the serious mistake they made when they allowed the two-acre exemption to be written into state law. For different reasons, both responsible mining companies and environmentalists realize that these two-acre sites cannot be allowed to go unregulated.

The federal Office of Surface Mining is now looking at ways to eliminate the two-acre loophole in the federal law. Our representatives in the state legislature, Orby Cantrell, Ford Quillen, and Dr. John Buchanan, ought to be working in Richmond to eliminate the potential for environmental abuse provided by state law.



8A Kingsport Times-News / Monday, July 27, 1981

Opinion

(Appendix D)

A message to Mr. Watt

Mr. James Watt
Department of the Interior
Washington, D.C

Dear Secretary Watt

You will be coming to our area this week to campaign for your friend, Marshall Coleman, the Republican candidate for governor of Virginia.

On behalf of the people of the region, let us say welcome. And on behalf of local conservation and environmental groups, let us say thanks for giving the movement a renewed dedication and sense of purpose. Your administration undoubtedly will make the majority of Americans realize the environment can indeed be destroyed in only one generation unless everyone acts to stop it. For that, we thank you. We only hope the realization will not come too late.

Now, on to business:

Your campaign tour will take you to the Southwest Virginia coalfields. Your guides will show you strip-mined land that has been reclaimed for development: shopping centers, schools, residential areas. The worth of those projects cannot be overestimated. We heartily support coal development in Appalachia and believe it the hope of the future — even though your boss, President Reagan, has cut needed funding for alternate fuels research.

But don't be misled. Your plans to dismantle enforcement of crucial strip mining regulations through "re-organization" of the Office of Surface Mining will not necessarily result in more or better development in the coalfields. Abuse of those standards is much more likely. That is what happened in the past when enforcement was left to the states.

If you stay with Mr. Coleman's friends, you won't get the full story. For that, you have to get away from the demonstration mines and talk to those who remember what it was like before the federal government "meddled" in the coal business. Ask the people in St. Charles if they want government off their backs. Mining interests there left when the coal played out, but unreclaimed mines still contribute to periodic flooding. The OSM has funds to reclaim these "orphan" mines and use local labor to do it. Is this the government intervention we are supposed to fear?

By all means talk to the coal men on your tour. Virginia has some of the best minds anywhere on the subject. They know the importance of coal to the region and the nation and they know how to get it out of the ground safely and cleanly. They know about transporting it to market and about alternate uses for coal and its byproducts. If anything, the experts have not been listened to enough when they promote coal.

But since the federal regulations were imposed, there has been hope the region can have both coal development and a livable environment. All states and all mining companies follow the same rules so no one has a competitive advantage. The federal standards came only after it was apparent states did not have either the will or the resources to regulate themselves. As we remember from civil rights days, "states' rights" is not always the honorable term Mr. Coleman claims it is.

Your tour of the coalfields can be very instructive if you haven't already formed your opinions and stereotypes — a problem we have with many "outsiders." We want the coal industry to be a winner again. We think it can be without sacrificing the land and the people to accomplish it. If you can't see that, you're in for a fight.

STATEMENT OF

JAMES MOONEYHAN
MAYOR, ST. CHARLES, VIRGINIA

BEFORE THE SUBCOMMITTEE ON ENERGY
AND MINERAL RESOURCES, COMMITTEE ON
ENERGY AND NATURAL RESOURCES

September 2, 1981

My name is James Mooneyhan. I am the Mayor of, and owner of a hardware store in, St. Charles, Virginia, a small coal mining town located in Lee County, Virginia.

My message to you today is simple and direct. If it were not for the federal strip mining law, I'm afraid our town would not exist today. Prior to passage of the federal law, strip mine sediment and deep mine refuse filled our streams, and floods devastated our homes and businesses. We experienced four serious floods in 1977 alone, and our extensively mined watershed became the focus of the Office of Surface Mining's first inspection. As a result of that inspection, and with the help of a local citizens group, we were able to benefit from emergency funding from OSM.

In the first phase of what was to be a ten year reclamation program, over 120,000 cubic yards of accumulated sediment was removed from 8 miles of streams. Sediment traps were placed at the head of four streams. As of July of this year, those structures had captured over 1,600 cubic yards of sediment. According to DMLR, without these structures a large part of this material would have ended up in the streams.*

In addition to the clearing of stream channels, an abandoned deep mine site and two gob piles were reclaimed. Also, a plan for reclaiming the most serious problems on the 800 acres disturbed by mining in our 8000 acre watershed were developed by TVA. This plan called for reclamation of 34 gob piles, 15 surface mines, 11 deep mines, and 3 refuse areas.

Another part of this first phase was the development of a data base which would serve as a basis for evaluating the effectiveness of the reclamation work.

The first phase of the program has now been completed. In phase I 31 of the 63 sites recommended by TVA will be reclaimed. But OSM, under the new administration has not committed itself to pursuing the long range objectives of the project. In particular, funds for the collection of environmental data and development of flood plain profiles have been deleted from Phase II. According to DMLR "this has significantly reduced the value of the data previously collected, and has seriously hindered other agencies, particularly the local housing authority, from developing programs because needed data is not available".

In closing, I would like to state that the citizens of St. Charles believe that our fragile watershed should be declared unsuitable for strip mining under the Federal Act. However, with the current confusion over final regulations, the Virginia permanent program, and possible weakening amendments to the Act, it is impossible for us to make an intelligent decision on how to proceed with efforts to safeguard our watersheds. We know that if the watersheds are not protected we will find ourselves in the same situation we were in , in 1977 when floods had become at least a yearly occurance. We believe the Act does not need amendments, it needs to be put into effect and enforced.

* St. Charles Watershed Reclamation Project Phase I Final Report, July 21, 1981, Prepared by the Division of Mined Land Reclamation

Mr. WAMPLER. Thank you, Ms. Williams, for your very fine statement and thank you for bringing the statement of the mayor of St. Charles. I have visited there many times and observed the progress made on the reclamation efforts. I think that is a very accurate description. I hope that any lingering doubts as to funding can be resolved quickly.

Our next witness is Stephen B. Smith, of the Appalachian People's Service Organization of Blacksburg, Va.

Mr. Smith, we would be happy to receive any statement you have in its entirety and to summarize it.

STATEMENT OF STEPHEN B. SMITH, COMMUNICATIONS DIRECTOR, APPALACHIAN PEOPLE'S SERVICE ORGANIZATION

Mr. SMITH. Thank you, Representative Wampler. My statement is rather short and deals mostly with the theological aspects surrounding the use of God's creation for mining of our resources.

Mr. Chairman, members of the committee, my name is Stephen Smith. I am the communications director for the Appalachian People's Service Organization (APSO), the Episcopal mission and ministry program in this region. I come to this hearing representing APSO, the Episcopal Church itself, and the hundreds of people I have come in contact with in these mountains who are concerned about the stewardship of God's Earth.

> The Earth is the Lord's, and the fullness thereof.
>
> Male and female he created them. And God blessed them, and God said to them, "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every thing that moves upon the earth."

The Earth belongs to God. Yet we've been asked to subdue it, to have dominion over every living thing. To some Christians these two biblical ideas are irreconcilable. Often, one is taken as valid over the other.

Actually, the two ideas are not in conflict at all, but they work together to tell a more complete picture of the relationship between God and humankind. God owns the Earth, and we have dominion over it. The relationship is like that of a landlord to a tenant. God gives us the Earth, but we must answer for how we use that gift to the giver and owner.

The Episcopal Church's Book of Common Prayer sums this up at two separate places. One prayer gives thanks "For the Good Earth which God has given us" and asks for the "wisdom and will to conserve it."

> And a contemporary collect asks God to:
>
> Make us always thankful for your loving providence; and grant that we, remembering the account that we must one day give, may be faithful stewards of your good gifts.

We are the stewards, the overseers if you will, of God's creation. So, I ask, is strip mining good stewardship of God's creation? No, it is not. As early as 1974, an ecumenical church panel on strip mining and the energy crisis, held in Wise, Va., called for the immediate phaseout of strip mining as a method of mining coal. The destruction of the land, the displacement of God's greatest creation (people), and the fact that such destructive work could be replaced by a more labor-intensive form of mining; namely, deep mining, all point to poor stewardship.

But in 1977, the Federal Government made an effort at some form of stewardship by passing the Surface Mine and Reclamation Control Act. We are at least making an effort to reclaim, to put back, what strip mining can destroy. And, today, we ask, how effective has that legislation proved to be?

Not very.

But I don't believe this is the fault of the legislation itself. It is more the fault of enforcement agencies on the State and Federal levels—namely, the Office of Surface Mining and the State divisions of surface mining.

For example, on the Federal level, in 1977 the Appalachian Coalition, of Brodhead, Ky., filed suit against the OSM charging nonenforcement of the law.

They won an out-of-court settlement.

As the coalition's director, Jan Sutherland said, "The coal companies kept saying the regulation was killing them. We proved there was little or no regulation going on."

On the State level, a study by a Tennessee-based group called the Save Our Cumberland Mountains (SOCM) shows lax enforcement of strip mine legislation. The study concluded that it takes an average of 11 months from the issuance of a notice of violation before legal action is taken. The study found 26 unreclaimed sites with notices of violation that have never been served a notice of bond forfeiture—these sites average 3½ years in their unreclaimed state. Finally, in a study from June 1878 through October 1979, SOCM found that in 64 percent of the cases filed as violations by the Federal OSM, the Tennessee DSM did nothing.

And then, there's the comical example of lax enforcement by a State DSM. In July of 1980, two Kentucky State mine inspectors were suspended for playing golf with two operators on the day they were supposed to be inspecting a mine.

Another problem with legislation so far, of course, has been compliance. Naturally, if enforcement is lax, compliance will be almost nonexistent. It costs money to comply with the law, and if you have a chance at getting away with violations, why bother? As one Ohio engineer recently confided, "most coal operators take the attitude of let 'em catch me."

The incidents of noncompliance are greater than any records could show. Records and studies could only list the number of citizens complaints and issuances of notices of violation. But of course, there are always those operators who never get caught.

Does the lack of enforcement and compliance mean we should open up the law to new legislation? Well, that could lead us to better stewardship. It would be wonderful to have legislation calling for an immediate phaseout of strip mining. Or, at the very least, legislation that would not allow States like Virginia to have exemptions from reclamation at sites under 2 acres.

But I believe the present climate in Washington, D.C., created by the election of a new President and appointment of a new administration, would seek to gut the present strip mine legislation and move us away from a policy of stewardship, if that legislation were opened up to change.

Already, newly appointed Secretary of the Interior, James Watt, has outlined proposed changes for the surface mine law. The August 20 issues of the Mountain Eagle listed a number of these proposals.

Concerning State surface mine laws, Watt would seek to replace the current definition of "consistent with" and "in accordance with" with a nebulous standard requiring that State regulations be only "as effective as" Federal regulations.

He would seek to eliminate redtape by terminating notices of violation merely with "a signed statement from the permittee that the violation has been abated" rather than requiring a follow-up inspection.

The penalty system which assesses the level of fines in relation to an operator's past and present performance would literally be dropped under Watt's proposed changes.

The ability of local citizens requesting mine inspections to remain anonymous would be taken away. How, then, would a relative of mine employees be able to complain about dangerous conditions without fear of reprisal.

Finally, when lax enforcement of the surface mine act has been proved through a law suit, Watt would seek to cut the number of Federal inspectors.

We at APSO believe these proposed changes would move the United States away from a process of good stewardship when it comes to coal mining. And, if the opening up of the present law to changes would only usher in James Watt's proposals, then we would like to see the law remain as it is.

The 1977 Surface Mine and Reclamation Control Act is a step in the right direction. Properly enforcing the existing law would be an even bigger move toward stewardship of God's Earth.

Thank you.

Senator WARNER. Again, I apologize. I am going to read everything very carefully and study it.

I want to get something clarified in my own mind. I am asking you to help me. You are very concerned over this 2-acre situation. That is one of your principal concerns and you are concerned now about State versus Federal administration of the law, and possibly new regulations, but it is my understanding that this 2-acre situation came about as follows: That the State of Virginia—I can't speak for all the other States—had a State law which pretty well controlled this small acreage problem and along came Uncle Sam in the 1977 act and took certain steps which ended in the State law being basically nullified.

Before we jump on the administration it seems to me that the great people up in Washington, they had a good deal to do with the creation of this problem of the 2-acre thing.

Danny Brown, am I correct in that summary?

Mr. BROWN. Yes, sir, that would be my summation of what has existed.

Senator WARNER. How it all got started?

Mr. BROWN. Yes.

Senator WARNER. There was a time when Virginia had some control over this 2-acre situation. And along came Congress and the Carter administration with the 1977 act and regulations and now it has given rise to this area in the law where certain abuses have taken place under the 2-acre exemption, is that a correct statement?

Mr. Brown. Yes, provided an incentive.

Senator Warner. What is your opinion?

Ms. Williams. I would like to ask Danny Brown if there is anything in the Federal law that says the State can't regulate the 2-acre mine. Does the law say that the State can't regulate the 2-acre mine?

Mr. Brown. No, that is the privilege that the State legislature provided.

Ms. Williams. Many States have gone even further and say that there are no 2-acre mines exempt under the Federal law. So Virginia did that of their own accord.

Senator Warner. The Virginia State Legislature——

Ms. Williams. Yes.

Senator Warner. I just want to get the situation clarified. Any other comments, Mr. Congressman, that you have?

Mr. Wampler. No, except I think the testimony of each of these witnesses, and especially of Sister Valle and Mr. Smith, are always appropriate. We need to be constantly reminded of what our responsibility is as God's stewards. We may have honest differences as to how we achieve that stewardship, but all of us will be called upon to account for our stewardship at some point in time someplace.

You raise a very legitimate concern.

I have discussed this with one of your colleagues, B. Lloyd, on more than one occasion in my office and elsewhere. I respected his sincerity. I didn't agree with him on everything and even last Saturday I had the opportunity to have been with your bishop at a mine location in southwest Virginia where we had a very interesting exchange of thoughts and ideas.

You know, we have been adominished many times to sit down and reason together. I certainly believe in that. The Bible tells us to do that. Just because we have honest differences of opinion doesn't mean that we can't sit down and exchange ideas, and you bring thoughtful ideas to us as you have here today. I appreciate your sincerity and I appreciate the tone of your presentation. You have given some helpful material to look at.

I hope as we develop experience, and expertise, if we find answers to many of these problems that have divided us in which we haven't been able to provide adequate answers and safeguards. I take a back seat to nobody that I want to see the environment protected, but I think as a Member of Congress, I have some responsibility to keep a viable economy and keep people working so they can provide for themselves and their family, and this is a classic confrontation. And it occurs on many issues and not just surface mining, one that we are constantly being reminded of. We appreciate the tone of your testimony. It is very helpful.

Senator Warner. I want to join the Congressman in that. He is the dean of our congressional delegation. He has been in a lot of hearings and I have been in many of them myself. I have yet to find [illegible]where such divergent interests have been presented in a fair dis[illegible]hed way so we can all sit here and quietly and understandingly take in all of this information. I thank you and I compliment you for that from the bottom of my heart.

Mr. WAMPLER. I want to add something, if I may. On the 2-acre exemption problem, I think there needs to be a distinction made. There is an abuse of the 2-acre exemption in Virginia, and there is also the problem of the legitimate 2-acre mine that is unregulated. And I think Virginia could control the abuse that has occurred through regulation. They could control the 2-acre mine problem, legitimate 2-acre mine through legislation. And they have included proposed regulation and legislation in their proposed permanent program, the resubmitted proposed permanent program. I don't think they have taken care of this problem in any way as far as I can tell. In fact, they have legalized the practice of deeding haul roads to the counties, which is a central problem with the 2-acre exemption.

So I think, you know, Virginia can deal with the problem. They haven't so far. I hope they will.

OSM, I think, can deal with the problem by regulation. They haven't, but they promise to.

Senator WARNER. Danny Brown, do you wish to make a comment?

Mr. BROWN. Yes, I would like to make a couple of more comments. You know, we can't lay this 2 acres aside because there has been some abuse, and I think industry is aware of that. We have some irresponsible operators on 2 acres, but this, I think, is the crux that we are going to meet with that we do have a lot of responsible industry that is concerned about the 2 acres, because they are complying with everything; somebody across the street is not.

In our permanent program submittal, it has been addressed to industry, we have met with industry and we have proposed and they have and the industry as a whole has promised some legislation from the State level to deal with the 2 acres.

I think the 2 acres in essence, they are small frys and I think it is something that has to be considered when you have to get a full permit, a full blown Federal permit. But on the State level, I think with reclamation responsible, when they leave there, it is environmentally sound, then I think we are going somewhere. But that is where we are heading in our Virginia program. Thank you.

Senator WARNER. We spent a lot of time on it yesterday and I assure you this program is going to be addressed.

Mr. Brown said a relatively few operators are causing a lot of heartburn for a lot of folks. It is interesting. Some of the operators told us yesterday, "If you give us a little help in this area, we will have a means of policing it up ourselves." I didn't ask him how he was going to do it, but he said he was going to get it done.

Thank you again.

All right, we now have panel E: Bill Caylor, president of the Kentucky Coal Association; John Bryan, Pittston Coal Co.; and Mr. Baker, president of Harlan County Coal Operators' Association.

Gentlemen, we thank you for taking time to join us. We will have Mr. Caylor. Would you lead off?

STATEMENT OF BILL K. CAYLOR, VICE PRESIDENT AND GENERAL COUNSEL, KENTUCKY COAL ASSOCIATION

Mr. CAYLOR. My name is Bill K. Caylor. I am vice president and general counsel of the Kentucky Coal Association. The Kentucky Coal Association represents both large and small, surface and underground operators in both eastern and western Kentucky. Our members mine a major portion of Kentucky's coal.

We wish to thank you for the opportunity to appear before the Subcommittee on Energy and Mineral Resources of the Senate Committee on Energy and Natural Resources. This oversight review of the Surface Mining Control and Reclamation Act of 1977—Public Law 95-87—comes at a time when our industry is struggling in an effort to comply with what we feel to be a poorly written act and repressive regulations.

The main thrust of our discussion today will be on specific portions of the Surface Mining Act which have severe economic repercussions on the coal industry and no attendant environmental protection.

But before we address these statutory problems we would like to comment on some other areas under review here today.

First. We strongly feel that the States should have the lead in the implementation and enforcement of the permanent regulatory program. We applaud the Office of Surfacing Mining's (OSM) latest proposed rule—July 1, 1981—which gives the States true flexibility in the development of their State programs. The proposed concept of "no less effective than" the Federal regulations will allow a State to address its local needs in a responsible and reasonable manner.

The old administration at OSM had made only a token gesture toward approving alternatives to the Federal regulations. These provisions had informally been labeled as the State window. To those more familiar with the old State window, it was called either a two-way mirror or, more appropriately, a knothole.

Second. Concerning the current proposed reorganization of the Office of Surface Mining, we totally support Secretary Watt. We base this support on: One, the new offices will be closer to Kentucky's coalfields and therefore closer to the problems that the operators face; two, we feel that the existing regional offices are too large and impersonal; and, three, it has been the experience of some of our member companies that they received little response from the regional office on specific problems.

Third. In regards to the regulatory agenda that has been proposed by OSM, we feel that it is much overdue. We again applaud OSM on its work with these proposed rules. Their basic thrust is to get the Government out of the job of determining design and allow the registered professional engineer to practice his profession responsibly. To those of us knowledgeable of the extent of the proposed changes, I would like to add that these changes represent no lessening of environmental protection. They are strictly geared at eliminating the redtape which is about to completely strangle the Kentucky coal industry and, in particular, the small operator.

Fourth. There are specific portions of the act which we simply feel constitute bad law. They serve no purpose toward the goal of enhancing the environment. Rather, they only serve to restrict the mining of coal.

The major problem in eastern Kentucky and in most of the Appalachian region is the act's mandate to completely backfill the highwall so that the land is restored to its approximate original contour (A.O.C.). Experience has shown that there is no legitimate reason for this requirement other than for esthetic purposes. The requirement to completely backfill the highwall to A.O.C. has presented some patently unfair situations for both landowners and operators in east Kentucky.

Flat land simply is at a premium in east Kentucky. And the most economical means of creating this flat land is as the result of surface mining. But the act provides no flexibility to its mandate of completely backfilling the highwalls.

Two explicit examples of the unfairness of this mandate are as follows: (1) A legitimate farmer contracted with a coal operator before the enactment of the Surface Mining Act to contour strip along a hillside and use the excess spoil to create a valley fill between the contours. The net effect was to create a level area of approximately 40 acres, consisting of a valley fill situated within a continuous highwall. When the operator was mandated to completely backfill the highwalls, a significant portion of the total acreage was lost.

(2) In another situation (Tollage Creek Elkhorn Mining Co.), a landowner gave a mining company the approval to contour mine his property under the condition that usable roads be left to allow a legitimate postmining use of the land. Again the operator was mandated to completely backfill the highwall, thus eliminating the road and any access to the landowner's business.

We do not advocate total elimination of the A.O.C. requirement. We do feel that in most cases—and I emphasize "most"—the coal seam should be covered with spoil to eliminate any resultant acid drainage. And for most operators, backfilling the bench is sound engineering practice since it serves as a convenient place for the storage of excess spoil.

We feel that the mandate to completely backfill the highway in all cases is a bad law and needs desperately to be repealed.

Other important sections of the act which we feel need to be repealed are as follows:

(1) Section 518(c)—prepayment of penalty requirement.

(2) Section 521(a)(3)—cessation of mining operations for failure to abate a violation with no prior hearing.

(3) Section 522—the ability to declare land unsuitable for mining without compensation of the mineral owner for this taking without just compensation.

(4) Section 502(e)(2)—citizen accompanying inspector during inspection of a coal mine. We feel that this section not only unduly infringes on the operator's right of privacy but also subjects him to unlimited liabilities should the citizen be injured while accompanying the inspector.

(5) Section 501(b)(11)—the probable hydrologic consequences determination catch-22. Here the act requires that this determination be made by the operator, but not until the hydrologic information is made available from the regulatory authority. The act further states that the operator's permit will not be approved until this information is available and incorporated into the permit application. Hence, the catch-22.

(6) Section 507(b)(3)—the requirement to list all previous, current, and pending permits in the United States held by the applicant. This is purely excessive "redtape."

(7) Section 515(b)(22)(B)—the requirement to remove all organic matter immediately prior to spoil placement in a fill. This is not prudent engineering in many cases.

(8) Section 515(c)(3)—postmining land uses. We feel that forestry should be included as a legitimate postmining land use.

(9) Section 515(e)(2)—land use allowed for A.O.C. variances. We feel that agricultural should be added to the list of land uses.

(10) Section 508(a)(11)—requirement to list all lands, interests in lands, options on such interests, or pending bids on lands contiguous to the proposed permit. We feel that this section should be deleted as an invasion of privacy and as a "redtape" requirement.

(11) Section 510(c)—the requirement to list on the permit application "any and all notices of violation of this act and any law, rule, or regulation of the United States, or of any department or agency in the United States pertaining to air or water environmental protection incurred by the applicant in connection with any surface coal mining operation." This should be eliminated or restricted solely to the particular State where the permit is applied for.

(12) Section 518(a)—$5,000 penalty maximum per each violation per day. We feel that this should be limited to a maximum of 30 days.

(13) Section 522(a)(3)(D)—areas subject to frequent flooding being subject to be declared unsuitable for mining. This includes all of east Kentucky.

(14) Section 528—surface mining operations not subject to the act. We recommend adding the remining of abandoned mine lands to this section. This would allow operators to "clean up" the abandoned mine lands without expense to the AML funds.

(15) Section 521(a)(3)—90-day limit for the abatement of a violation. We feel that this should be the goal but not mandated in all situations.

(16) Title IV—abandoned mine land reclamation. We feel that these activities and funds should be transferred completely to State control and administration.

(17) Section 515(b)(25)—requirement of a natural coal barrier. This is not technically justified.

(18) Section 515(c)(3)(B) (ii, iii, iv, v)—postmining land use requirements. We feel that these subsections should be eliminated as "redtape" and unnecessarily restrictive.

(19) Section 507(b)(4)—requirement to list "all names under which the applicant, partner, or principal shareholder previously operated a surface mining operation within the United States within the 5-year period preceding the date of submission of the application." This is unnecessarily burdensome for the legitimate large company.

(20) Section 508(9)—the listing of "the steps to be taken to comply with applicable air and water quality laws and regulations and any applicable health and safety standards." This is totally unnecessary. A list of permit numbers for those various permits would suffice.

Senator **Warner**. Mr. Bryan.

Mr. **Bryan**. Before I get into the brief prepared remarks I have, I would like to comment on some testimony that was presented by Mr. Gillman from the SCS.

The Clinchfield Coal Co. has made petition to the SCS for some abandoned land money to be used at a gob pile to correct some deficiencies of gob pile near Dante. Mr. Gillman compared that gob pile to the, or having potential to create the same kind of disaster that happened with the Buffalo flood in West Virginia, and that is completely erroneous. There is absolutely no, positively no way that that kind of a situation exists anywhere on the Pittston property, especially at that installation.

For the benefit of the record and press, if they are here, I would like to make that point.

Mr. **Wampler**. May I ask one question?

Senator **Warner**. Yes, indeed.

Mr. **Wampler**. The site in question at Dante, is it owned by Clinchfield Coal Co.? Is it on Clinchfield property?

Mr. **Bryan**. There is some adverse property adjacent to the refuse area, the gob pile proper. I think we still, yes, we still retain the ownership of that. The problem was that some homes, the area was traditionally historically a mining camp. Some of those homes were sold to individuals back a couple of decades ago, and there may be some private land or some adverse property we refer to that actually has gob on it.

Mr. **Wampler**. Is it true that that refuse was a result of deep mining many years ago?

Mr. **Bryan**. Yes, sir. It is a side hill dump which is very common for this area.

STATEMENT OF JOHN BRYAN, JR., WEST VIRGINIA COAL ASSOCIATION

Mr. **Bryan**. I realize you said the act probably wouldn't be opened up at any time in the future, but I think it is apparent that some of the problems are deeply rooted in the act itself and that eventually this has to happen.

I think in the early days in the drafting of the act some very smart people got involved and what we thought originally was going to be high wall elimination turned out to be approximately original contour. To kind of reiterate what Bill Caylor said about creation of flat surface—this requirement deprives the landowner of the ability to create surface that he may use.

Another section, section 515(b)(10), the ground water section—it is my opinion as currently written the regulations are unworkable in the terrain that we are operating in or the Appalachian coal fields, the type terrain we are operating in. The problems of ground water that exist in the West just don't exist here.

Another section, section 515(b)(20), the reclamation bond duration—we are required to keep bonds for 5 years, and that is, I think we can demonstrate on practically any previously mined and reclaimed area in the State or in the Appalachian fields that that is too much time. We have got two very distinct growing seasons. We get approximately 50 inches of rainfall a year, and it is asinine to think that we need to keep an area under bond for 5 years. These bonds can constitute a substantial amount of money.

Another section is 516(b)(12), which more or less eliminates up-dip mining, which is the most advantageous way of mining, if possible, in acid- or iron-producing seams. We feel like that it deprives the engineer of ability to design a mine that may be in that kind of a seam or seam described as acid, iron producing that would otherwise be designed in mining, except from manner. The law as it is written strictly forbids that.

Section 522 is an area, I guess, dear to a lot of people's heart in Virginia, and this is areas unsuitable. This is probably potentially the most onerous section of the act. This section is contrary to many of the basic premises on which this country was founded. Tricky phrases such as "prior existing rights" and "historical mining use" only help to confuse the mining companies and delay the permit process.

The part that is the real mystery to me is in the East we have condemnation without any type of compensation. However, in the West, in the alluvial valley floor areas where mining is prohibited, the Federal Government has seen fit in those areas to offer owners of the coal reserves trade-off areas. It seems we are not getting the same treatment.

Another section is 522(e)(5). This is a section that prohibits mining within certain distances of homes and schools and other institutions. I am sure that the 300-foot barrier requirements in most of the valley floors in this area would probably extend from one side of the hill to the other. Unfortunately, the railroads came through years ago and got the best part first. There is in most valleys a steam bed of public highway and a sprinkling of houses here and there. If there happens to be a substantial coal reserve, it is lost, and it is lost even if the mine site, the actual mine site could be 1,500 or 2,000 feet away, and all you want to do is build a load-out facility, it is still lost.

Under the purpose of section 101, I personally feel that the differences between underground mining and surface mining have never really been explored. I don't think that the people who drafted the original regulations really took into consideration the difficulties with underground mining to begin with. It is a tough business to begin with, and when you are subjected to the kind of requirements that the act and the regulations make, it is practically impossible to conduct a mining operation.

I don't think, given the state that the economy was in in 1977, I don't think that this act could have passed, if the title hadn't been an Underground and Surface Mining Act. I think that there are enough people in the Congress who recognize that the underground industry was already burdened with health and safety laws that make it almost impossible to work. I don't think that the act would have even passed. I think it is time that someone looked more closely at section 101 and the differences between underground mining and surface mining, and more particularly associated with the terrains that we are in.

There is one other thing that I would like to say, and that is that I think where we need immediate relief is in the area of haul roads and access roads to mine sites. I think that could be done maybe through regulation. We are the only, as far as I can ascertain, we are the only entity in the United States that cannot build a cut and fill road on private property, and that includes all the State and Federal agencies.

Anyone who wants to build a cut and fill road, can build it, except the mining industry.

Of course, we are the only single industry in the United States that was ever singled out for a piece of environmental legislation as drastic as this is. Clean Air Act, Clean Water Act, and most of it—all the other environmental legislation was a nationwide blanketwide statute. This wasn't. I think that probably the best thing that could be done right now to help the industry would be to help us on the design standards and the construction standards for haul roads.

Thank you.

[The prepared statement of Mr. Bryan follows:]

STATEMENT OF JOHN BRYAN, JR.

THE SENATE ENERGY SUBCOMMITTEE HEARING ON THE SURFACE MINE ACT

SOUTHWEST VIRGINIA COMMUNITY COLLEGE
RICHLANDS, VIRGINIA

September 2, 1981

Senator Warner, Director Harris, Ladies and Gentlemen:

My name is John Bryan. I am Group Environmental Engineer for the Pittston Coal Group.

I am here today representing the West Virginia Coal Association.

My remarks are brief and will address certain sections of the Surface Mine Act which I feel need amending.

Let me first say that we in industry detect a change in attitude and philosophy in the most recently published OSM regulations. Although not favorable or industry oriented, these regulations indicate a willingness to work toward equitable solutions to some of the more serious problems. This was not indicative of the last administration.

It is apparent, however, that some problems are so deeply rooted in the act itself that regulatory changes cannot provide the relief that the industry must have.

Examples are:

Section 513(a). Permit advertisement periods. This section requires that a permit be advertised for four consecutive weeks and remain on file for an additional month. This procedure adds more than two months to the permit process. It is cumbersome and over restrictive.

Section 515(b)(3). Approximate original contour. This term was used simultaneously with highwall elimination which everyone was in favor of. Actual AOC practice is very different from highwall elimination. The practice renders many acres of potentially usable mined land no more useful than it was prior to mining. The practice deprives land owners the right to upgrade their property for higher land uses.

Section 515(b)(10). Groundwater. The groundwater requirements imposed nation-wide are not applicable to the Appalachian coalfields. The historical problems associated with western mining does not exist in the Appalachian areas. These areas should not be subjected to the stringent requirements of this section.

Section 515(b)(20). Reclamation bond duration. This section requires a coal company to maintain a five (5) year reclamation bond. Past history proves that revegetation can be accomplished in a much shorter time in the eastern coalfield. The Appalachian area receives approximately 50 inches of rainfall each year. The area has two distinct growing seasons per year.

Section 516(b)(12). Downdip mining. This section denies the operator any latitude in selecting mine openings in acid or iron bearing coal seams. This is prejudical legislation. The mining company should be allowed to exercise its engineering expertise in mine design to prevent problems from these types of seams.

Section 522. Areas unsuitable. This is potentially the most onerous section of the Act. This section is contrary to many of the basic premises on which this Country was founded. Tricky phrases such as "prior existing rights" and "historical mining use" only help to confuse the mining companies and delay the permit process. How the government can allow or permit the taking of Eastern reserves without compensation and completely reverse the issue (by providing land trade) in the West is a mystery to me.

Section 522(e)(5). This section is particularly burdensome in the steep valleys of Appalachia.

In closing, I would like to say that the area in which we need immediate relief is haulroad design and construction. To the best of my knowledge, the coal industry is the only entity in the United States, including State and Federal governments, that cannot build a cut and fill road.

Senator **Warner**. Thank you very much. [Applause.]
Mr. Baker.

STATEMENT OF JAMES E. BAKER, PRESIDENT, HARLAN COUNTY COAL OPERATORS' ASSOCIATION, HARLAN, KY.

Mr. **Baker**. I am James E. Baker, and president of Harlan County Coal Operators' Association.

Senator Warner, we, of the coal industry, wish to express our appreciation for holding these oversight hearings and an opportunity for all citizens to make their comment. I am pleased that my neighbor, Congressman Wampler, is here, and we thank him for his interest.

I do not believe that the U.S. Congress ever intended or conceived that the Federal Surface Mining Control Act of 1977 would cause the unjust harm that it has brought to the coal mining industry in this country.

I believe that a balanced program, as projected by Secretary Watt, is our way in this country, that we can place this thing back in balance, and that is the one I support.

I can say that every operator that I work with believes in environment, they believe in clean water, and they believe in the humanity that makes its living from this. They are responsible and professional as people, and are responsible to their community as well as to the coal industry. Those are the ones who are licensed and permitted.

In the last few years, the Federal environmental laws have placed the primary responsibility of implementation upon the States. I think it is their responsibility to take this and to utilize it, to bring about the best mining conditions that can exist. I think they have to have regionalization. They have to be able to use site specifics, and they have to be able to utilize the various problems of terrain that exist.

I am deviating from my statement. I will only briefly hit on this. The statement will stand as the official document.

The Federal Surface Mining Act of 1977 should be amended and I am one of the people here today that believes that we need to get at some factors in that immediately, because a wrong staying a wrong doesn't make it right. I didn't say the act should be appealed, only factors to be amended.

One, that the act prohibits industrial activity; that it shifts regulatory decisionmaking from the States to the Federal Government. It imposes national standards on regionally unique mining activity.

It has allowed OSM to impose national uniform design criteria through which performance standards are to be attained. This is applicable in general through over 6,000 mines in this country.

We, of the Harlan County Coal Operators' Association, recommend to the Congress that there be a review to require compliance with performance standards rather than design criteria, which would consider important regional and site differences to achieve required levels in a most cost efficient way.

I am going to itemize other items:

High wall elimination and restoration to the approximate original contour.

In Bell County, Ky., 23 percent of all of the tillable land has been brought about in the last 5 years through surface and mountaintop removal. It has been made possible and is being used to gaze cattle, raise all types of agricultural products, and it can be done. Another that I direct that it needs to review is the access roads section, section 515.

Hydrological consequences, section 507.

Prepayment of penalty—because of the courts, the judicial system of this country allows a person has to be found guilty, you know. This one does not. It takes that away from him and takes his financial ability from him, or he loses his court right, one or the other.

Bonding, section 509.

Deep mining, as referred to by my colleague under section 101, I do not believe it was the intent of Congress that deep mining should be a part of this, but it is treated with the same respect in applying the same regulations to the deep mining industry.

I have two recommendations that I would hope that the Congress would consider in the amendment process. The providing of an economic impact statement, that Congress should and is requested to amend Public Law 95-87 by adding a section which would require that an economic impact statement shall be taken and utilized in the implementation of each section of this act; that the results be used in determining the need and types of mining inspection programs.

One other point that I would like to direct that certainly needs review is the land unsuitable for mining. We can take the goldenrod. We can take it off and buy seed, plant it after we make land useful, but we cannot feed the 42,000 people of Harlan County, Ky., without a mining industry, because there are no other industries there.

There is a constant questioning of professional engineers, geologists, agriculturists, specialists, all highly trained and graduates of our universities throughout this country, that State and Federal, both State and Federal lawmakers, Governors, and others who are responsibile, are not responsible. They are responsible by vote of the people, but the implication is that they are not responsible to mining and they do not have the respect of the various sections of our country.

Thank you for the opportunity and God bless.

Senator **Warner**. Thank you. [Applause.]

[The prepared statement of Mr. Baker follows:]

PREPARED STATEMENT

BY

JAMES E. BAKER, PRESIDENT
HARLAN COUNTY COAL OPERATORS' ASSOCIATION
HARLAN, KENTUCKY

BEFORE

U. S. SENATOR JOHN WARNER - VIRGINIA

OVERSIGHT HEARINGS ON THE
FEDERAL SURFACE MINING CONTROL AND RECLAMATION ACT

AT
RICHLANDS, VIRGINIA
SEPTEMBER 2, 1981
10 A. M.

I am James E. Baker, President of Harlan County Coal Operators' Association of Harlan, Kentucky. Senator Warner, we of the coal industry thank you for holding this oversight hearing and for the opportunity to make comments.

I do not believe that the United States Congress ever conceived the damaging effects that the passage of the Federal Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87) would have on the coal mining industry of this nation. I further believe the Congress will approve amendments to this law (Public Law 95-87) that will permit this industry to continue to grow and maintain its status as one of the nation's greatest private industries.

In the last few years the federal environmental laws, enacted by Congress, proclaimed that states should retain the "primary" responsibility for implementation. Public Law 95-87 is one of those. When in reality the state's only decision is whether or not the state program should be "equal to" or "more stringent than" federal regulation. But, in practice, the Office of Surface Mining has projected constant criticism that some phantom state will downgrade its own regulations to attract industry. Obviously, if any state is not fulfilling the obligations of its own statutes, it should not be allowed to function as a regulatory entity.

The Federal Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87) should be amended to allow the Secretary of Interior to invalidate a state program only if a court of competent jurisdiction finds the state program not in compliance with the purposes of the Act. This law:

1. Inhibits industrial activity.
2. Shifts regulatory decision making from states to the national government.
3. Requires the industry to prove, through detailed permit requirements, an absence of injury prior to receiving a permit.

4. Imposes national standards on regionally unique mining activities.
5. Has allowed O.S.M. to impose national uniform design criteria through which performance standards are to be attained. These criteria apply without variation to over 6,000 mines of every size, in every part of terrain or hydrologic setting in this country.

We, of the Harlan County Coal Operators' Association, recommend the Surface Mining Control and Reclamation Act (Public Law 95-87) be amended as follows:

1. To require compliance with performance standards rather than design criteria-standards which would consider important regional and site differences to achieve required levels in a most cost-efficient way.
2. Highwall elimination and restoration to the approximate original contour, Section 515 (b) (3) be amended to authorize state regulatory agencies to waive compliance with environmental performance standards if an operator or land owner can show an alternate procedure through a post mining land-use plan which will:
    (a) Restore the land to a condition capable of supporting pre-mining uses or higher or better uses.
    (b) Create a no-actual environmental harm or public health or safety hazard.
3. Access Roads, Section 515 (b) (17 and (18). Evaluation should be on a site specific basis by qualified personnel.
4. Hydrological Consequences, Section 507 (b) (11) and (15) (b) (10). There is no guarantee that if the operator follows the burdensome design criteria that he will meet the water quality standards. Design criteria for sediment control measures should be eliminated and be placed on a site specific basis.
5. Prepayment of Penalty, Section 518 (c). Prepayment of penalty should be eliminated. This question is whether it is constitutionally legal for a

coal company to have to "prepay" the penalty imposed before it has an opportunity for a hearing. The company is assumed to be guilty and must prove its innocence during a hearing. If the company, for any financial reason, cannot prepay the penalty, then it loses its chance for a day in court.

6. Bonding Section 509, Having to bond before a permit application is submitted and dollars are lost and tied up in bonding can never be used for for reclamation. Incremental bonding requirements should be liberalized. Post no bond until surface disturbance is started. Eliminate the adjusting or additional bonding after the original bonding.
7. Deep Mining. This act should not be used to regulate and control deep mining. We believe that all references to deep mining should be removed from this "surface" mining act.
8. Economic Impact Statement. The Congress should and is requested to amend Public Law 95-87 by adding a section which would require that an economic impact statement shall be taken and utilized in the implementation of each section of this Act. That the results be used in determining the need and types of mining inspection programs.
9. We believe that the industry will be responsible for the highest standards of environmental control, and:
10. Maintain the highest of safety standards for all coal miners.

Thank you for this opportunity. God Bless

Senator **Warner.** Also, I would like to observe again the very dispassionate, forward, tempered approach to a subject which is fraught with a lot of controversy. Thank you.

We will now proceed to our last panel. We broke the last panel down into two panels. We first have Mr. Shropshire, vice president of the Maryland Coal Association; Mr. Richard Fender, president of the Virginia Surface Mining and Reclamation Association, Inc.; and Benjamin C. Greene, president of the West Virginia Surface Mining and Reclamation Association.

Mr. Shropshire, we will lead off with you. All of your statement, of course, will be made part of the record in its entirety, and we appreciate your summarization.

STATEMENT OF GEORGE D. SHROPSHIRE, VICE PRESIDENT, MARYLAND COAL ASSOCIATION

Mr. **Shropshire.** Thank you, Senator, you and your subcommittee, and Congressman Wampler and Mr. Sindelar; I thank you for the opportunity of being here today and participating in this hearing and offering what value we can to it. I have sat through the entire hearing today and listened to all the testimony, and every word that is in my statement has been said at this point. To add anything further to it would be more repetitious than anything else.

I want to emphasize three points and I will take little of your time.

I agree with Mr. Baker wholeheartedly, and the Maryland Coal Association as a whole does feel that the act itself does need to be amended. At what time it is amended is under discussion. I don't think it needs to be done immediately, but we see it in the end as having to be amended, not appealed or not written off the books.

For instance, those questions that are in the act itself, we do not believe—I say we, I am speaking for the association—we do not believe that regulations can supplant the law. The act is very specific. It goes into very intricate detail to set out various points.

In Maryland at the present time we are operating under court injunction on the State primacy program and the permanent regulations. I participated in that court case and we hope they will continue to operate there until permanent regulations are firmed down, and we all know where we are going and the frustration and the confusion ceases.

The operators in the Maryland Coal Association support State primacy. They have initiated already an effort to comply back the early part of this year when primacy was received by the State, and we found it so confusing that we couldn't comply, so we went to court for an injunction. That is where we are today. We stand ready to comply when it is in the proper court.

The only other point I want to make is that the law itself has a tendency at this point to stem productivity. I see that changing, and it has been said here today by others under the new administration and Mr. Harris' procedures. We see that productivity increasing.

I thank you for your time here today. That is all I offer above my written statement. Any questions I will be glad to try to answer.

[The prepared statement of Mr. Shropshire follows:]

September 2, 1981

Statement of testimony for the United States Senate Subcommittee on Energy and Natural Resources oversight hearing to review the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87) by the Maryland Coal Association. Presented September 2, 1981, 10:00 a. m. at the Russell Building Auditorium, Southwest Virginia Community College, Richlands, Virginia.

As for introduction, I am George D. Shropshire, Vice President, Maryland Coal Association, 103 Brandywine Drive, Cumberland, Maryland 21502, Telephone: (301) 729-0366.

It is my understanding this hearing is being conducted to review the Surface Mining Control and Reclamation Act of 1977, and to determine if P.L. 95-87 is being implemented in accordance with the intent of Congress. The testimony presented for this hearing is directed to general problem areas in the Act itself and the implementation process. Details of any specific requirement are not being considered in this presentation.

The State of Maryland received primary and conditional approval of its state regulatory program from OSM on December 4, 1980. The conditions of approval required modification and addition to the state code to permit implementation of the OSM approved program. This was accomplished in the 1981 Session of the Maryland Legislature.

Immediately following state primary program approval, the coal industry in Maryland initialed a very determined compliance effort in cooperation with the State Bureau of Mines. Four months later, the industry was chaotic.

Due to court litigation opinions, floundering in OSM with interpretations of the Act itself and supporting permanent regulations that were physically impossible to comply with, the industry became one of complete frustration.

At this point, the Maryland Coal Association went to Court for industry relief. An Injunction and Restraining Order was obtained against the state primary approved program. The Maryland industry is presently operating under the interim regulations and, hopefully, will continue in that posture until such time that firm, reasonable and technical regulations are adopted at the Federal and State level that can be complied with to offer ample environmental protection and sound productivity of our coal resources.

The Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87) was signed into law with very intricate technical requirements. Court opinions, expert technical considerations, field experience and common sense dictate a full review and amendments to the Act itself. We are of the opinion that regulation cannot supplant law. The requirements of the Act with regards to the application and hearing process, criteria for sediment control, unsuitable lands, explosives, haul roads and drains, hydrologic consequences, overburden, bonding, post land use and the penalty assessment point system should have a full review with a follow-up of the necessary legislative and regulatory modifications.

The Maryland Coal Association is of the opinion that the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87) should have the flexibility providing for all states to operate under an approved primary program that considers area specific needs. State primary program regulations would be approved by OSM to accomodate site specific conditions, and at the same time, provide for implementation of the law as intended by the Congress.

OSM would function as an over-view agency and with proper funding to the states, implementation and enforcement could be provided that would eliminate another federal bureaucratic agency of major proportion, control mining reasonably, amply protect the environment and stimulate productivity.

Senator WARNER. We thank you for your participation and in the interest of your Governor and your State.

Mr. Fender.

STATEMENT OF RICHARD W. FENDER, PRESIDENT, VIRGINIA SURFACE MINING AND RECLAMATION ASSOCIATION, INC.

Mr. FENDER. Mr. Chairman, ladies and gentlemen. I am Richard W. Fender, president of Virginia Surface Mining and Reclamation Association. Our nearly 200-member companies produce over half of Virginia's deep-mined coal and approximately three-fourths of the State's surface-mined coal. Our membership also includes most of the major suppliers of goods and services to the Virginia coal industry.

We are grateful for the opportunity to present our views on Public Law 95–87, the implementing regulations, and other matters related to the law. And we commend you, Senator Warner, for making this hearing possible. We usually have to travel to Washington to present our testimony and it is refreshing to talk about coal in the area where it is actually mined.

We have heard it said many times that history repeats itself. On July 4, 1776, a group of representatives of the 13 Colonies assembled to pen the Declaration of Independence. In this declaration were the truths on which this great Nation was established.

In response to the abuses by the King of Great Britain for the establishment of an absolute tyranny over the States, the Founding Fathers described certain activities being taken against the citizens of the colonies. Quoting from the Declaration of Independence:

> He has erected a Multitude of new Offices, and sent hither Swarms of Officers to harrass our People; He has imposed taxes on us without our consent; He has deprived us, in many cases of the benefits of trial by Jury; He has suspended our own Legislatures, and declared themselves invested with Power to legislate for us in all Cases Whatsoever.

A parallel can be drawn, Mr. Chairman, between the protests of our respected representatives of 200 years ago and the outrageous events which have reappeared in 1981 in the guise of a law supposedly designed to protect the environment. The main difference is that "he" has now become our own "Federal Government," an entity which, out of control, may in time destroy the foundations of liberty and individual freedom which it was created to preserve.

As you are aware, our organization has long opposed many of the provisions of Public Law 95–87. You will recall that, before the passage of this law, VSMRA predicted several specific results for Virginia. Among these were:

Greatly increased production costs.

Drastically decreased production of surface-mined coal.

Significant increases in unemployment.

Tremendous waste and inefficiency in the Federal bureacracy charged with administering the law.

Little, if any, improvement in environmental quality.

We were repeatedly told by supporters of the law that we were distorting the facts, misinformed and, worse, that we were telling half-truths based on heresay evidence. But now, after having Virginia's surface coal production decrease by nearly 40 percent, the record, which VSMRA so vividly pointed out, speaks for itself. Production costs have gone through the roof with increases ranging from 40 to 100 percent. Through the domino effect, thousands of Virginians have been adversely affected by this law. Waste and inefficiency were rampant in OSM under the previous administration, although we quickly note the drastic improvements in this regard under Interior Secretary Watt and OSM's new management team. Environmental quality, on the other hand, has improved precious little, if at all, under Public Law 95–87.

Tragically, one of the most frightening element of this ill-advised piece of legislation is the fact that those responsible for the law's passage refuse to even sit down and discuss the disastrous effects it has had on the Nation.

Today, we would like to address the law itself and the implementing regulations. While the goals of some Federal regulations are laudible, this law contains numerous unreasonable, unrealistic and totally unnecessary provisions. It is written in confusing, legalistic language and embodies little commonsense. We have, however, identified the changes which we feel are absolutely critical to achieving any semblance of balance in the Federal surface mining law.

The first of these required changes is under title IV, abandoned mine reclamation. The 15-year program authorized under the law is far too long and too expensive. Conservatively, this program will cost the American public nearly $7,000 per acre for each acre of so-called abandoned lands in Virginia. As a minimum, the life of the program should be cut from the present 15 years to 5 years; and those operators mining abandoned lands should be exempt from the title IV tax on coal removed from such lands. Under the law, an operator must reclaim these lands anyway. The Federal Government and the taxpayer would then be relieved of the obligation to reclaim them. So, why should the operator be required to pay a tax on mined coal to pay for reclaiming abandoned land that he is going to reclaim anyway at his own expense? If the operator was exempt from paying the tax, he would have an additional incentive to remine these areas. Thus, Mr. Chairman, the coal would be mined and the land reclaimed all in one simple operation. By exercising this approach, the so-called abandoned lands would be reclaimed much more quickly and at less expense than is provided for under the law.

Title V contains many provisions which have badly crippled the coal industry. The most difficult is the requirement of "approximate original contour," or "AOC," Environmentally, AOC gains nothing. It actually increases erosion potential and destroys any usefulness of the land.

Technically, reclamation to AOC causes extreme safety hazards, especially to the heavy equipment operators who must return steep slopes to original contour. Imagine the danger involved if this equipment should overturn and pin the operator underneath.

Economically, mining costs have increased significantly and that cost must be passed along to the consumer—you, me, and the millions of low-income Americans, particularly the elderly who barely are able to exist on fixed incomes. As little as 10 years ago, the prospect was for abundant, low-cost energy availability in our vast coal reserves. This prospect has turned into an ever-increasing and more costly energy nightmare, thanks to Public Law 95–87.

Constitutionally, the right of private property rights took a beating with this well-engineered piece of legislation. Those who support an increasingly more powerful Federal Government, much to the detriment of private property and States rights, must have surely smiled broadly on August 3, 1977, when this bill was signed into law because under the fifth amendment of the U.S. Constitution, ". . . nor shall private property be taken for public use, without just compensation." Therefore, Mr. Chairman, Public Law 95–87 is right in step with loss of individual property rights.

The absolute prohibition against placing even 1 ounce of spoil on the downslope during mining makes as much sense to a coal operator as a farmer being required by law to restore the land on which his crops were grown to the exact mineral content existing prior to the planting of those crops. Further clarification of a ridiculous situation would be to require, by law, every fisherman to recompensate the sea for the ecological imbalance caused by withdrawing fish from these waters.

The penalty provisions of section 518 need revision. Under the 5th and 14th amendments to the U.S. Constitution guaranteeing that no man's life or liberty will be denied without due process of law, a citizen is assumed to be innocent until proven otherwise. The exception by implication of section 518 of Public Law 95–87 is that a coal operator who, when charged with a violation, is required, in effect, to pay a fine * * * in order to have a hearing * * * at which his guilt or innocence is determined. What kind of democracy is this which requires a person to pay for a hearing when guilt has yet to be established? With section 518 of this law, the time machine of democracy has been set back 206 years when there was no U.S. Constitution.

The so-called "lands unsuitable" provisions of section 522 require a massive overhaul to be even marginally acceptable. As they now stand, these provisions are an open invitation to harassment of coal operators and landowners by extremists, they help to further destroy property rights, and they frustrate legitimate mining. As pointed out by our distinguished representatives of the Thirteen Colonies in 1776, "He has erected a Multitude of new Offices, and sent hither Swarms of Officers to harrass our People . . ." So be it with section 522 of Public Law 95–87. We will be pleased to assist your staff in drafting required changes.

Finally, we feel it is imperative that all land use requirements be eliminated from the law. Use made of land by a private landowner should be of no concern by the Federal Government, so long as local and State land use criteria are met.

Relative to the implementing regulations for the law, we would like to reserve detailed comments at this time. OSM is involved in a diligent and far-reaching effort to bring meaningful changes to the regulations so that they more closely reflect the original intent of Congress when Public Law 95–87 was first envisioned. We would like to assess the full impact of these revisions before commenting.

We would like to strongly endorse the efforts of President Reagan, Interior Secretary Watt, and OSM Director Harris to streamline Federal agencies and programs, cut the fat and the waste from their staffs and budgets. eliminate burdensome and unnecessary regulations, and to allow the States reasonable freedom in conducting their own affairs. We pledge to them and to you our full support in this endeavor.

Thank you for allowing us this opportunity to comment.

At this time, I will be pleased to respond to any of your questions or comments.

Senator WARNER. Mr. Greene, it is nice to see you again. You are an active participant. You were working on the floor of the U.S. Senate to get the amendment through the old 1977 act.

We got them through the Senate.

STATEMENT OF BENJAMIN C. GREENE, PRESIDENT, WEST VIRGINIA SURFACE MINING AND RECLAMATION ASSOCIATION

Mr. GREENE. Excellent.

Mr. Chairman, Congressman Wampler, members of the staff, ladies and gentlemen, I am Ben Greene. I am president of the West Virginia Surface Mining and Reclamation Association. We represent about 370 companies that are directly and indirectly involved in the mining of coal in the great State of West Virginia.

It is a pleasure to appear before the committee. I share Mr. Fender's obseravtion about bringing the subcommittee to the coalfields. It seems to me to be a welcome addition, one that I certainly would encourage in the future.

It seems that we have spent many hours and much time in going to Washington to testify, to appeal or whatever, and I notice even the U.S. appeals court in Cleveland a few days ago said that may not be necessary even in the regulatory process, that was mandated for in the act. So, Mr. Chairman, I commend you and your subcommittee on this wise choice of coming out and seeing the action on the ground.

It seems to me a common theme running through all the testimony today, including both panels C and D, were the 2-acre exemption problem, mandates that change in 95–87.

We have in our prepared remarks outlined some 20 areas to that. We also endorse the testimony of panel E, that preceded us here, and, of course, certainly endorse the testimony of my fellow colleagues here at the table with me at this time.

I would like to justify three or four of these changes and suggest a ready remedy. Before I do that, the reorganization which has been of much concern here today, generally with the feeling, let's give Director Harris and his new organization time to respond, I think is excellent.

I can offer an immediate solution, I believe, to a problem in Tennessee. The State of West Virginia, as you are well aware, is the only major coal-producing State east of the Mississippi that has been granted primacy to operate their own program. We would volunteer the total OSM enforcement and technical staff to go down to the State of Tennessee posthaste and move into the problems that we heard from panel C here today. I think that would be workable and would be very beneficial to the overall program, and I would hope that Director Harris or Deputy Griles or Dean Hunt or somebody would certainly convey that thought back to them.

[Laughter.]

VOICE. Thank you.

Mr. GREENE. That is the kind of ready recommendation that can be easily implemented and I know, Dean, you are appreciative of that fact.

About three major areas of recognized change that has absolutely no environmental or other consideration, and that, Mr. Chairman is in sections 507, 508, and 512, primarily dealing with the application procedures. It has a very devastating effect, both on the underground industry of this county, as well as the surface industry. It has absolutely no value, and I would certainly endorse the comments of Tony Abar, who is a very capable administrator in the State of Maryland, who outlined those problems in his testimony.

I would say amen. And also John Bryan, who said the very same things, and I won't repeat those things. Such unnecessary studies as the all permits, all violations, 51 days of public advertising, those things have no benefit. They can be shortened, the time span can be lessened, the same information can be obtained many different ways, and that would certainly be of major benefit.

Secondly, much has been said about approximate original contour, and it occurred to me a very interesting phenomenon, and again I congratulate the committee for coming down yesterday and actually touring the area. As we traveled throughout southern West Virginia and into the rolling areas here of the beautiful limestone corner of southwestern Virginia, it is a very interesting phenomenon that everything is done on the level. The roads seem to be built on the level, most of the major housing communities were from the level. Even this beautiful little cottage nestled here on top of the rolling hills is built on the level. It would seem to me that in itself would necessitate the approximate original contour concept and would give total commitment to a relooking at that particular part of section 515 that makes this mandatory.

In addition to that, the post mining land use regulations that again go into land use and not the surface mining and reclamation process has dictated the stack back or the materials being retained up on top, which has eliminated the potential for the major development, and as attested to by Director Harris early, several shining examples of this kind of concept, well developed in West Virginia as well as in the southwestern corner of Virginia. It seems to me we have a golden opportunity to continue that in a very responsible way that should be encouraged.

I would totally encourage the acceleration of the abandoned mined land program. It is my understanding that the fund is in excess of $800 million. There seems to be a problem, if the money is not allocated, it hasn't been appropriated; or if appropriated, it hasn't been allocated. When we have the St. Charles community problems or the many other areas of abuse, in years gone by, it seems to me like with a readily available source of funding, that we should move out of the paperwork requirements, the planning and all the other exercises that we are going through, and accelerate the abandoned mined land program, whether it is the RAMP program, that conducted by the Office of Surface Mining, or that underway by the States.

Early indications are frightening in that some early experience in West Virginia says that two-thirds as much money is being spent for paperwork leading to the reclamation as the reclamation is costing, which makes it a consulting engineer's dream and very little done on the ground.

The other area that we are somewhat concerned about in West Virginia is the SOAP program. It seems to me that it is now time to move into change in that particular area.

I think in terms of a major recommendation that you should draw from the Department of Energy or some of the other Federal guidelines in what constitutes a small operator to begin with, because the 100,000-ton limit, certainly today and time, with the very complex procedural requirements today is doomed, if it hasn't already passed.

We encourage your attention to that, and enumerate that in our prepared remarks.

In closing, I would point out that I have always been taught that good stewardship is wise use. It is not prohibited or preventive or locked up, but is wise use in a responsible manner.

I commend the committee and, Mr. Chairman, you in particular for the balanced approach.

We have a little magic triangle up in West Virginia that we talk about and that is the economic, environmental, and energy needs of this country, all balanced, and when you have reached that, I think you have reached the goal that we look for and hope will come out finally of the passage of the first Federal Surface Mining Act in the country in 1977.

It is my observation that we were 7 years in the preparation of that particular legislation, went through two Presidential vetoes, and we finally put it into effect. We have been 4 years in its implementation and in its application. Much of that time has been spent in the Federal courthouse, and we still hear the problems such as the wildcatters in Tennessee and 2-acre exemption, and it would seem to me if there is any common theme today running through this total testimony, it is one that prays for reopening the Act and seeking some changes that would make this a workable piece of legislation.

I compliment your staff. I have had excellent cooperation from Messrs. Harvey, Sindelar, and Andes. We thank you for the opportunity to testify here today.

[The prepared statement of Mr. Greene follows:]

TESTIMONY

"OVERSIGHT HEARINGS TO REVIEW
SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977"

SUBCOMMITTEE ON ENERGY & MINERAL RESOURCES
U.S. SENATE COMMITTEE ON ENERGY & NATURAL RESOURCES

RUSSELL BUIDING AUDITORIUM
SOUTHWEST VIRGINIA COMMUNITY COLLEGE
RICHLANDS, VIRGINIA
SEPTEMBER 2, 1981

Presented By

BENJAMIN C. GREENE, PRESIDENT
WEST VIRGINIA SURFACE MINING AND RECLAMATION ASSOCIATION

MR. CHAIRMAN, COMMITTEE MEMBERS, LADIES AND GENTLEMEN, I AM BEN GREENE, PRESIDENT OF THE WEST VIRGINIA SURFACE MINING AND RECLAMATION ASSOCIATION. IT IS A PLEASURE TO APPEAR BEFORE THE SUBCOMMITTEE THIS MORNING ON BEHALF OF THE ASSOCIATION, WHICH IS MADE UP OF SOME 370 SEPARATE MEMBER COMPANIES INVOLVED EITHER DIRECTLY OR INDIRECTLY IN THE MINING OF WEST VIRGINIA COAL.

TWO YEARS AGO, WHEN I APPEARED BEFORE YOUR COMMITTEE, I NEVER THOUGHT THAT I COULD SERIOUSLY SAY THAT IT WAS A "PLEASURE" TO OFFER OVERSIGHT TESTIMONY ON THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977, AND THE OFFICE OF SURFACE MINING'S PROGRAMS. THAT, HOWEVER, HAS CHANGED. I AM SINCERELY PLEASED TO OFFER THE FOLLOWING COMMENTS.

OF THE PAST 49 MONTHS, 41 OF THEM HAVE BEEN "TRYING" FOR THE WEST VIRGINIA COAL INDUSTRY. SINCE AUGUST 3, 1977, THE PREVIOUS ADMINISTRATION IN WASHINGTON KEPT TELLING THE REGULATORS AND INDUSTRY IN OUR STATE THAT WE HAD ONE OF THE BEST SURFACE MINING CONTROL AND RECLAMATION PROGRAMS IN THE NATION.

YET, WE WERE THE MOST INSPECTED STATE IN THE EAST. WE WERE TOLD, TIME AND TIME AGAIN, THAT OUR REGULATIONS WERE INADEQUATE AND THEY MUST BE REPLACED WITH REGULATIONS WRITTEN IN WASHINGTON. WE WERE HARRASSED WITH FRIVOLOUS VIOLATIONS WHICH CARRIED EXTREME MONETARY PENALTIES FOR WHICH THERE WAS NO ALTERNATIVE BUT "GO TO THE COURTHOUSE" FOR SETTLEMENT.

IN SHORT, THE "NEWCOMERS" IN WASHINGTON WERE TELLING A STATE AND AN INDUSTRY THAT HAD BEEN INVOLVED IN SURFACE MINING REGULATION SINCE 1939 THAT "THEY DID NOT KNOW WHAT THEY WERE DOING AND IT MUST BE CHANGED TO COINCIDE WITH OSM POLICY."

THAT ATTITUDE PREVAILED THROUGH JANUARY OF THIS YEAR, WHEN WEST VIRGINIA FINALLY RECEIVED APPROVAL OF ITS PRIMACY PACKAGE. I SAY "ITS PRIMACY PACKAGE." THAT IS NOT REALLY ACCURATE SINCE MUCH OF THE PROPOSAL WAS DICTATED BY THE PREVIOUS OSM MANAGEMENT. IT MADE LITTLE DIFFERENCE TO THEM WHAT WEST VIRGINIA WAS PHYSICALLY DOING ON THE GROUND. THEY WANTED THE "PAPERWORK," MEANING REGULATIONS AND GUIDELINES, TO BE A REGURGITATION OF THE FEDERAL RULES AND POLICIES. I WILL MENTION MORE ABOUT THIS LATER.

AS THE FIRST 41 MONTHS FOLLOWING AUGUST 3, 1977, WERE "TRYING," THE PAST EIGHT MONTHS HAVE BEEN REASSURING. IN FEBRUARY, WITH JAMES WATT, DICK HARRIS, AND STEVE GRILES ASSUMING THE HELM AT OSM, THINGS BEGAN TO HAPPEN AS THEY SHOULD HAVE FOUR YEARS AGO. SECTION 101(F) WAS FINALLY IMPLEMENTED LIKE CONGRESS HAD INTENDED.

WITH THE NEW ADMINISTRATION, THE 1977 ACT BEGAN TO BE REASONABLY INTERPRETED--THE STATES WERE ONCE AGAIN PUT IN CHARGE OF THEIR PROGRAMS--AND, THE AGENCY'S MANAGEMENT WAS MADE MORE EFFICIENT AND MEANINGFUL. THE ONEROUS OSM PROGRAM WAS MOVING FROM AN ATTITUDE OF "THEORETICAL ENVIRONMENTAL CONTROL" TO ONE OF "PRACTICAL CONTROL." THEY WERE SHIFTING REGULATORY MATTERS OUT OF THE COURHOUSES, BACK TO THE "MOUNTAINSIDE" WHERE THEY USED TO BE AND WHERE THEY BELONG!

THE REASSURANCE OF THIS NEW APPROACH IS WHAT GIVES ME "PLEASURE" TO APPEAR HERE TODAY. IT IS ALSO SOMETHING THAT I DID NOT THINK TWO YEARS AGO WE WOULD EVER SEE.

THE ATTITUDE CHANGE IS IRONIC. THE MOST VOCAL CRITICS OF WATT, HARRIS, AND GRILES ARE THOSE THAT INSIST THE ACT MUST NOT BE CHANGED. WHILE THOSE CRITICS PREDICT ENVIRONMENTAL "DOOMSDAY" WITH ANY ALTERING OF THE ACT, THEY SIMULTANEOULSY CRITICIZE THE ACTIONS OF THE NEW ADMINISTRATION. THE IRONY IS THAT THE APPROACH TAKEN BY THE NEW MANAGEMENT IS THE ONLY THING THAT HAS SAVED THE ACT FROM COMPLETE POLITICAL UPHEAVAL. IF THE PREVIOUS ADMINISTRATION'S POLICIES HAD CONTINUED, THE 1977 ACT WOULD HAVE BEEN THE "RALLYING POINT" FOR THE INDUSTRY AND THE STATES, BOTH INSISTING ON CHANGE IF COAL WAS TO BE MINED IN THIS COUNTRY.

MORE REASON--MORE PRACTICALITY--AND MORE RESPECT FOR THE STATES AND THE INDUSTRY HAVE QUELLED THE CONTROVERSY. WITH SUCH AN APPROACH, THE NEW OSM HAS DILUTED THE NEED FOR IMMEDIATE STATUTORY CHANGE.

WE, AS AN INDUSTRY, APPRECIATE THE NEW LEADERSHIP. AS OPERATING IN WEST VIRGINIA, THE ONLY MAJOR COAL-PRODUCING STATE IN THE EAST WITH PRIMACY, WE ARE PLEASED TO ONCE AGAIN BE ABLE TO TAILOR A STATE PROGRAM BASED ON OUR ACTUAL NEEDS, RATHER THAN THE THEORETICAL NEEDS AS SET IN WASHINGTON.

WE ALSO FEEL THAT THE SHORT-SIGHTEDNESS OF THE GROUPS AND INDIVIDUALS SO CRITICAL OF SECRETARY WATT AND OSM IS VIVIDLY DEMONSTRATED BY THIS VERY ISSUE. AS I SAID, THE NEW

ADMINISTRATION IS THE ONLY THING THAT SAVED THE 1977 ACT, IN ITS PRESENT FORM. THIS IS WHAT THE GROUPS INSIST ON, YET THEY FIND FAULT WITH EVERYTHING THE NEW OSM IS DOING.

SINCE "CONSERVATION" HAS REPLACED "PRESERVATION," THESE CRITICAL GROUPS DON'T LIKE IT!

INSOFAR AS THE OSM PROPOSED REORGANIZATION IS CONCERNED, I CAN SAY THAT IT SEEMS TO BE A MORE PRACTICAL APPROACH THAN PREVIOUSLY ESTABLISHED. IT INTENDS TO PUT OSM IN THE TRUE OVERSIGHT POSTURE DICTATED BY THE ACT. IT "DOWNPLAYS" THEIR PRESENCE INSOFAR AS THE INDUSTRY IS CONCERNED SINCE THEY WILL BE OVERSEEING THE STATE'S ACTIVITIES. THIS IS ALSO IN ACCORDANCE WITH THE ACT.

THE MOVE FROM CHARLESTON TO PITTSBURGH WILL NOT AFFECT THE WEST VIRGINIA INDUSTRY. WITH THE STATE HAVING PRIMACY, THE STATE DNR IS THE PERMITTING AUTHORITY. THERE WILL BE NO NEED TO TRAVEL TO PITTSBURGH FOR THOSE MATTERS. WITH A FEW EXCEPTIONS INVOLVING FEDERAL LANDS, WE HAVE NOT HAD TO GO TO MORRIS STREET IN CHARLESTON FOR THOSE MATTERS.

ANOTHER FAVORITE PROBLEM RAISED BY THE OPPONENTS TO THE REORGANIZATION IS THE MATTER OF ACCESS FOR THE ASSISTANCE PROVIDED BY OSM. I CAN TELL YOU THAT IF THAT ASSISTANCE IS THE SAME AS IT HAS BEEN FOR 49 MONTHS, THE TRIPS TO PENNSYLVANIA WILL BE INFREQUENT.

THE STATE OFFICE, WITH DIRECTOR AND INSPECTION STAFFS, IS AN APPROACH WE TOTALLY SUPPORT. IT EXHIBITS THE STATUTORY MANDATE OF A "STATE LEAD" PROGRAM.

AS I HAVE MENTIONED SEVERAL TIMES, WEST VIRGINIA IS THE ONLY MAJOR COAL-PRODUCING STATE IN THE EAST TO HAVE PRIMACY. WE GAINED PRIMACY ON JANUARY 19, 1981. IMMEDIATELY THEREAFTER, WE, AS AN INDUSTRY, SOUGHT AND OBTAINED AN INJUNCTION FOR THE MORE ONEROUS PARTS OF THE APPROVED PACKAGE. SPECIFICALLY, THE NEW REGULATIONS WERE ENJOINED AS WAS THE IMMEDIATE NEED FOR PRE-EXISTING FACILITIES TO BE PERMITTED OR REPERMITTED. THE INJUNCTION WAS NECESSARY BECAUSE SO MUCH OF WEST VIRGINIA'S PERMANENT PROGRAM REGULATIONS HAD BEEN DICTATED BY OSM IN WASHINGTON AND THEY WERE SIMPLY UNWORKABLE IN OUR STATE. UNWORKABLE FOR BOTH THE INDUSTRY AND THE STATE REGULATORY AUTHORITY.

IT WAS ALSO NECESSARY TO DELAY FINAL IMPLEMENTATION BECAUSE OF THE NEW ADMINISTRATION TAKING OFFICE. THE NAMES, FACES, AND, MOST ASSUREDLY, THE APPROACH AND GOALS OF OSM WERE BEGINNING TO CHANGE. IT WOULD HAVE BEEN PREMATURE, WITH THE FEDERAL GOVERNMENT CHANGING, TO PERMIT A NEEDLESSLY RESTRICTIVE PROGRAM TO TAKE EFFECT IN WEST VIRGINIA, WHEN THE THEME OF FEDERAL REGULATION WAS "A UNIFORM NATIONAL RECLAMATION STANDARD." THEREFORE, THE STATE COURT FELT SUCH INJUNCTIVE RELAY WAS JUSTIFIED. THE INJUNCTION WAS ORIGINALLY GRANTED WITH AN EXPIRATION DATE OF SEPTEMBER 19TH. THE GENERAL MOOD IN WEST VIRGINIA, HOWEVER, INDICATES THAT AN EXTENSION OF THE SEPTEMBER 19TH DEADLINE IS NEEDED. AN EXTENSION WOULD PERMIT THE STATE TO BETTER UNDERSTAND WHAT THE MINIMUM REQUIREMENTS, AS SET BY OSM, WILL BE FOR THE ULTIMATE PERMANENT PROGRAM. THE EXTENSION IS PRESENTLY BEING CONTEMPLATED BY ALL PARTIES INVOLVED WITH THE MATTER.

DESPITE THE FACT THAT THE NEW OSM HAS BROUGHT "FRESH LIFE" TO THE 1977 ACT, THERE ARE AREAS WHICH NEED ATTENTION FROM YOUR COMMITTEE AND THE CONGRESS. AFTER FOUR YEARS OF EXPERIENCE WITH THE ACT, THESE ARE ITEMS THAT NEED CHANGE IF THE PROGRAM IS TO BE COMPLETELY SUCCESSFUL.

SUCH THINGS AS THE EXTENSIVE TIME PERIODS ASSOCIATED WITH PERMITTING NEED ATTENTION. UNDER THE NEW STATE LAW, WHICH WAS PASSED IN 1980 PURSUANT TO THE FEDERAL ACT, A PERMIT FOR ANY SORT OF MINING OPERATION OR FACILITY IN WEST VIRGINIA TAKES FROM THREE TO NINE MONTHS FOR APPROVAL. PUBLIC COMMENTS IN WEST VIRGINIA ARE MINIMAL. I MIGHT SAY THAT IT HAS NOT ALWAYS BEEN MINIMAL. THE 30-DAY PERIOD FROM THE LAST ADVERTISING DATE IS UNNECESSARILY LONG. SUCH A PERIOD SHOULD BE 30 DAYS FROM THE FIRST DATE OF ADVERTISING IN THE LOCAL NEWSPAPER. FOR EIGHT YEARS, IT WAS THAT WAY (30 DAYS AFTER FIRST PUBLICATION DATE) IN WEST VIRGINIA AND THE PUBLIC'S COMMENTS WERE ALWAYS A VITAL PART OF ANY PERMIT APPROVAL.

TWENTY-ONE DAYS, WHICH IS THE TIME THAT WOULD BE ELIMINATED BY SUCH A CHANGE, MAY SEEM INSIGNIFICANT TO THE AVERAGE PERSON. HOWEVER, WHEN ONE MUST BE CAPITALIZED TO THE EXTENT NECESSARY TO CONDUCT A MODERN MINING OPERATION, IT IS "DEAD TIME." IT MEANS A WAIT FOR WHICH PAYMENTS MUST BE MADE, BUT DURING WHICH THERE IS NO REVENUE. THE CUMULATIVE DOLLAR EFFECT OF SUCH DELAYS IS STAGGERING. THIS CHANGE IS CRITICALLY IMPORTANT TO THE INDUSTRY, AND WOULD HAVE INSIGNIFICANT EFFECT ON THE PUBLIC OR THEIR OPPORTUNITY FOR INPUT.

ANOTHER AREA OF THE ACT WHICH NEEDS IMMEDIATE ATTENTION IS THE APPROXIMATE ORIGINAL CONTOUR PROVISIONS THAT MANDATE THE "BACKSTACKING" OF MATERIAL ON MOUNTAIN-TOP MINING OPERATIONS. AS YOU WELL KNOW SENATOR, STACKING MATERIAL BACK ON THESE MOUNTAIN TOPS IS COMPLETELY CONTRARY TO THE NEEDS OF SOUTHERN WEST VIRGINIA, SOUTHWESTERN VIRGINIA, AND EASTERN KENTUCKY. WE NEED FLAT LAND, CAPABLE OF DEVELOPMENT WHICH PROVIDES AN OPPORTUNITY FOR GROWTH IN THESE REGIONS OF THE EAST. A REGION THAT DESPERATELY NEEDS ECONOMIC DIVERSIFICATION AND EXPANSION. MOUNTAIN-TOP MINING, WHEN DONE USING MODERN TECHNOLOGY AND VALLEY-FILL TECHNIQUES, IS AESTHETICALLY AS WELL AS ENVIRONMENTALLY SOUND.

THE "STACKBACK" OFFERS NO BENEFIT WHATSOEVER TO OUR PARTS OF THE COUNTRY. FOR EVERY FOOT OF DIRT STACKED BACK ON THE PLATEAU, THERE ARE TWO FEET LESS USABLE LAND ON TOP. WE NEED FLAT LAND, NOT STEEP RIDGE LINES!

THE OPPORTUNITY FOR FUTURE USE IS THE IMPORTANT PART OF THIS RECOMMENDATION AND THE MOUNTAIN-TOP OPERATIONS. TO SPECIFICALLY SET FORTH A USE BEFORE MINING BEGINS IS NEITHER PRACTICAL NOR NECESSARY. IT IS THE OPPORTUNITY TO UTILIZE THE INGENUITY OF OUR REGION'S BUSINESSES AND INDUSTRIES. WITHOUT SUCH FLAT LAND, THERE WILL BE NO INGENUITY! AND, THUS, NO NEW OR EXPANDED INDUSTRIES OR BUSINESSES.

AN ADDITIONAL AREA OF SIGNIFICANCE, INSOFAR AS OUR INDUSTRY IS CONCERNED, RELATES TO THE CRITERIA FOR "SMALL OPERATORS" AS DEFINED IN THE ACT. THE LIMIT OF 100,000 TONS PER YEAR IS UNREALISTICALLY LOW IN TODAY'S MINING COMMUNITY.

AN OPERATOR WHO DOES NOT MINE THAT AMOUNT WOULD NEED MORE THAN THE HELP OF OSM'S SMALL OPERATOR ASSISTANCE PROGRAM (SOAP).

PERHAPS THE COMMITTEE SHOULD RESEARCH OTHER FEDERAL DEFINITIONS OF "SMALL OPERATOR" AND INCORPORATE THEM INTO PL 95-87. FOR INSTANCE, TVA AND THE COAL LOAN PROGRAM TALK OF SMALL OPERATORS AS THOSE THAT PRODUCE LESS THAN ONE MILLION TONS PER YEAR. THAT IS NOT NECESSARILY THE ANSWER, BUT WE DO ENCOURAGE YOUR ATTENTION TO CHANGING THE MAXIMUM TO AT LEAST 250,000 TONS PER YEAR. THIS WOULD ENHANCE THE INTENDED BENEFIT OF THE SOAP PROGRAM. PRESENTLY, IT IS SERVING A VERY SMALL PERCENTAGE OF THE INDUSTRY THAT NEEDS THE ASSISTANCE PROVIDED FOR IN THE ACT.

IN ADDITION TO THESE ENUMERATED ITEMS, I HAVE INCLUDED A LIST OF ADDITIONAL SUGGESTIONS FOR NEEDED STATUTORY CHANGES. THIS WAS SUBMITTED TO THE HOUSE INTERIOR'S SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT ON MARCH 28, 1980. THE LIST HAS BEEN MODIFIED TO REFLECT THE CHANGE OF ATTITUDE IN OSM AS SHOWN IN THEIR RULEMAKING EFFORTS AS WELL AS THE CHANGES BROUGHT ABOUT BY WEST VIRGINIA GAINING PRIMACY.

ON BEHALF OF THE WEST VIRGINIA COAL INDUSTRY, I WISH TO EXPRESS MY APPRECIATION TO YOU, SENATOR WARNER, AND THE OTHER MEMBERS OF THE SUBCOMMITTEE, AS WELL AS ROGER SINDELAR AND RON ANDES OF THE STAFF FOR BRINGING THE OVERSIGHT HEARING TO RICHLANDS. BASED ON OUR EXPERIENCES WITH THE PREVIOUS ADMINISTRATION, WE DID NOT THINK YOU COULD HAVE AN OVERSIGHT HEARING ANYWHERE BUT WASHINGTON, D.C.!

I ALSO WISH TO APPLAUD SECRETARY WATT, DIRECTOR HARRIS, AND DEPUTY GRILES FOR THEIR COOPERATION AND FORESIGHT AS EXHIBITED IN THE FIRST SEVEN MONTHS IN OFFICE. THEY HAVE ACCOMPLISHED MORE, FROM THE STANDPOINT OF PRACTICAL AND EFFECTIVE ENVIRONMENTAL PROTECTION, IN THESE FIRST SEVEN MONTHS THAN THE PREVIOUS OSM MANAGEMENT DID IN THREE AND ONE-HALF YEARS. DESPITE OUR RECOMMENDATIONS FOR STATUTORY CHANGE, THE INTERPRETATIONS AND RULEMAKING EFFORTS OF THE NEW OSM HAVE MADE GREAT STRIDES IN FULFILLING THE INTENT OF PL 95-87. ANY SUCCESSFUL PROGRAM MUST BE BASED ON COOPERATION BETWEEN THE INDUSTRY AND THE REGULATORS - NOT ANTAGONISM. I ENCOURAGE FULL CONGRESSIONAL SUPPORT OF THEIR PROPOSALS.

AGAIN, I APPRECIATE THE OPPORTUNITY TO EXPRESS THE VIEWS OF THE WEST VIRGINIA COAL INDUSTRY BEFORE THIS SUBCOMMITTEE, AND STAND READY TO ASSIST THE COMMITTEE, OSM, OR ANY AGENCY INVOLVED WITH THE PROGRAM IN ANY WAY POSSIBLE.

I WOULD BE HAPPY TO ANSWER ANY QUESTIONS.

NECESSARY CHANGES TO PL 95-87
OVERSIGHT HEARINGS
SUBCOMMITTEE ON ENERGY & MINERAL RESOURCES
U.S. SENATE COMMITTEE ON ENERGY & NATURAL RESOURCES
RICHLANDS, VIRGINIA
SEPTEMBER 2, 1981

1. Section 402(f)(2)

   Should provide for direct and actual funding to the states. The moneys to which a state is entitled should be directly deposited in that state to the benefit of its economy.

2. Section 408(a)

   Delete requirements for placing lien on property. Any reference to filing a lien on private property should be removed. It is counterproductive to the intent of Title IV.

3. Section 506(a)

   The time periods set forth should be extended to provide adequate time for state regulatory agencies to review and manage immense numbers of permits which must be submitted pursuant to the permanent program. The two-month limitation is particularly critical.

4. Sections 507 & 508

   Both sections should be thoroughly reviewed and the requirements amended to streamline the permitting process, eliminate the onerous and needless information requirements, and provide for the flexibility of states to require only the information pertinent to the needs, not the needs of the entire country. A federal agency should not require state agencies to be clearinghouses for information which is national in scope.

5. Section 507(c)

Should be changed to better project the actual intent of the Small Operator Assistance Program. Presently, the SOAP program is so complicated that it is not of any benefit to those that need the help. The maximum production should be increased to, at least, 250,000 tons per year.

6. Section 513(a)

Advertisement period and public comment period should be limited to 30 days total.

7. Section 513(b)

"Person with an interest which is or may be adversely affected" must be defined in the Act so as to actually protect those persons whose interests may be affected by activities covered by the program. Presently, the regulations define such persons so broadly that its significance is eliminated. It is a means of harrassment to the industry, the states, and those persons who are directly affected.

8. Section 515(b)(20)

The five-year term for revegetation approval should be amended in accordance with the proven experience of different states. It is much too long for Eastern states. It is punitive to the conscientious operator.

9. Section 515(b)(25)

Should provide for constructed barriers as well as natural barriers. Such constructed barriers would, in many cases, be far superior to the natural barriers.

10. Section 515(c)

The post-mining land use requirements should be amended to encourage such development of mined land, not penalize the operator for attempting or wanting to improve the utility of the land. The potential for development is much more significant in the Eastern states than is the immediate development of the land. Many times a landowner does not know exactly what sort of development would be the most beneficial to the area.

11. Section 515(c)(4)(A)

Provide that a constructed barrier can be placed around the perimeter of an operation as a barrier to slides and erosion. These constructed barriers are more dependable and stable than is the toe of the coal seam.

12. Section 516(b)(12)

Should provide that the regulatory authority can permit "up dip" underground mining operations when considerations of safety to mining personnel and the public are foremost.

In March, 1980, there were two separate cases of major amounts of water impounded in abandoned mine works breaking out, without warning. There have been a number of similar type situations in the past in our state which have caused extensive damage to life and property.

13. Section 518(c)

Remove requirement that any penalty be paid in full prior to having an appeal of a violation of penalty considered by the Department of the Interior.

14. Section 519(a)

The release of a permit should be a process of encouragement rather than a series of delays, hearings, and overall penalty to the operator. The permit has been subjected to a myriad of public scrutiny and routine inspections throughout its life. It need not continue in the last stages.

15. Sections 522(a-d) and 510(b)(4)

The petitioning process for unsuitability must be clarified and limited so as not to pose such a threat to the continuation of industrial activities and property rights of land and mineral owners. Equalization of the petitioning mechanism must be accomplished through more accurate definitions and limitations on the prohibitions during administrative review periods. Petitioners should be required to notify, by certified mail-return receipt requested, all landowners within the petition area prior to its being accepted by the regulatory authority.

16. Section 522(e)

Provide for waiver by owners or controlling interests of structures and facilities other than only an occupied dwelling.

17. Section 701(25)

Delete "and regulations issued by the Secretary pursuant to this Act." This would make the Act consistent throughout, particularly with 101(f).

18. Section 719

Should be amended to insure that the states can adopt and administer programs suited to the needs of their particular state and industry. A clause should be added to assure that OSM does not encroach on the authority granted to MSHA by Congress. If final provisions are set forth by OSM, reciprocity among the states should be mandated.

GENERAL

Licensed Land Surveyors should be recognized in the Act insofar as the preparation of maps, cross-sections, etc. are concerned and required by various sections of the law.

Senator **Warner**. Thank you, gentlemen. Thank you very much for the helpful testimony.

We will now proceed to our last panel. We have Mr. Louis Hunter, executive director of the National Independent Coal Operators' Association, Richlands, Va.; Mr. Roger Jones, chief engineer with Paramont Mining Corp.; and E. K. Street, attorney at law, Grundy, Va.

Mr. **Hunter**. We appreciate the opportunity to testify, Senator Warner. Before I introduce Mr.—well, I might clarify one thing. Mr. Evans, on the end, is an expert geologist. He is here to answer questions, but I think the other two gentlemen will have testimony. I would like to put this into the file. This is the report done for the Department of Interior, Surface Mining, a year or so back. Maybe Roger or somebody knows about it. This is a draft. We do not accept it. I have a letter from the man and he doesn't want his name mentioned. He stated that they would not accept these findings. These are actual findings in the industry.

I would like to submit these. I don't think OSM has them. According to his letter, I think they put in file 13.

Senator **Warner**. Mr. Hunter, we will take them under consideration and determine the propriety.

Mr. **Hunter**. OSM, they did not like them.

At this time I will introduce Mr. Street.

Senator **Warner**. We will determine the propriety of including them in the record.*

Mr. **Hunter**. Mr. Street will speak first.

STATEMENT OF E. K. STREET, ATTORNEY AT LAW, GRUNDY, VA.

Mr. **Street**. Mr. Chairman, Congressman Wampler, and staff, I hope you will permit me to vary somewhat from my remarks.

Senator **Warner**. To give a brief summary?

Mr. **Street**. Also in listening to some of the comments, I would vary, and I feel my comments would be more pertinent if I vary somewhat.

Senator **Warner**. Your remarks will be made a part of the record.

Mr. **Street**. I am confident that you have formed many opinions.

Senator **Warner**. The committee and some staff members went over some of the areas yesterday. Mr. Harris was with me yesterday and your chief man from Virginia, Mr. Brown.

Mr. **Street**. I am sure that based on that you have formed opinions——

Senator **Warner**. I have been here many times and will be back many more. I wanted the chief man from Washington to take a look and he learned a lot.

Mr. **Street**. I am so happy that you came down. I think that is essential in your understanding of the situation.

Senator **Warner**. A total success except for the fishing.

Mr. **Street**. I would like to clarify one thing. Sitting over there, I felt like maybe the record was portraying the coal industry or proponents of the coal mining as being heretics or not good stewards of resources. I could not help but recall when the theological discussion was given, about the parable in the Bible about the use of the talents, about the man who was given 1 talent, and one given 5 talents, and another 10 talents, I believe. I have the distinct feeling that the 1977 act is an attempt for us to hide our talent in the ground.

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*See appendix II.

I am not speaking just about coal. I think we have the tendency to view the resource of coal as being the only resource that is being considered here. I noticed today many people have commented on the level land that is left after the stripping and mining operation. One comment was made that the land is not really used. You may notice, if you have occasion to read the prepared remarks, that although I am an attorney and have represented coal companies in probably 37 or so OSM cases, I also live on a ridge that is bounded by surface mining operations. You may have even observed it yesterday. It is near the Grundy airport. If you didn't observe it, it is one of the most descriptive examples that you could ever find. One side of the mountain surface mining took place prior to the 1977 act. On the other side surface mining took place subsequent to the 1977 act. It would have to, I think, take a very unobjective viewer not to see the benefits of leaving the land on the bench.

On the mountain where I live there are approximately 19 homes, I believe. All but three of those have been built on areas that were surface mined. The airport is constructed on an area surface mined. Two community ball fields were constructed.

Senator WARNER. I have seen much of that area. I saw an area yesterday where there is going to be 300 homes put on it.

Mr. STREET. Then you are well aware of the benefits of returning the use of the land.

Senator WARNER. I don't believe anybody ever characterized you as heretic.

Mr. STREET. I didn't think they were characterizing us, but I thought I should make it clear, sometimes it gets in the subconscious because you are not supporting the Surface Mine Act, therefore you are opposed to conservation, and the very opposite is true.

My contention, and I think it is justified from the studies that have been made, is that the act opposes conservation. It wastes our resources. Our resources of coal are wasted because you can't get to the coal that you can get to without the act. There is coal left on points that cannot be reached. There is coal left in the areas that can't be reached by roads that are constructed in accordance with the regulations. We are wasting the resources of our miners who are quitting the industry, left and right, because they will not stand for the harassment, for the risks to their economic capital. They don't have the resources to spend and they are getting out of it.

I looked at a few of the files just before I started to make this talk, just the first few files I had, and I noticed immediately four different operators who had left the industry. One of them went into the grocery business, one of them is driving a truck—now these were operators who owned their mines. The other one, I don't know what happened to him. He disappeared. They all left the industry. It concerns me, and maybe I am different from everyone else who spoke today—certainly the ones whom I have heard, all these speakers have spoken of the amendment. It reminded me of a suit, and maybe you have had the experience, if you get a suit that doesn't fit, you can take it back to the tailor sometimes five times and it is not going to fit generally until you finally get it worn out and forget it.

I submit that is what is going to happen to this act of keeping on trying to fix it and trying to fit it, and then we have another administration, they try to fix it. But who really enforces it are the inspectors out on the ground.

Mr. Griles, who was appointed as head of the enforcement in Washington, he will give out a directive, and when the inspector gets out on the ground, he is going to do what he wants to do. He is not going to do what that directive says.

Senator **Warner**. Let's hope that doesn't take place now. I regret that Mr. Harris had to get on a plane and go back to Washington. He will examine this record, as will Mr. Griles.

Mr. **Street**. That is one reason I would like to make that comment.

Senator **Warner**. My continuation of the oversight on this subject, if that takes place, I would like to have documented cases.

Mr. **Street**. All right, I will guarantee you that, if I come across it I will send it to you.

I am sure that documented cases are always more interesting than generalities. I would like to give you two or three documented cases to show you the unfairness and unjustness that was cited by an earlier speaker here. I believe it was the president or executive secretary of the Virginia Surface Miners Association.

Some of these cases I have been involved in and some of these cases I have read from the report. I was involved in one case where the operator had surface mined or deep mined, he said he was deep mining, trying to open up a deep mine, but the OSM considered him to have been surface mining. They should have noticed the violation and issued a cessation order, of course, without a hearing, as has been mentioned here today, because that is the standard procedure.

I might point out that this is even done when temporary relief has been requested, as happened to me twice when I had to go to Federal court to ask for an injunction. Each time after you file these requests in Federal court, then OSM drops it, but not before.

In this specific case, the operator was required to go back on the bench five separate times to compact the land and to reseed it. When we finally got to a hearing, and after the man had been assessed fines of over $40,000 and closed down for a considerable amount of time, I believe it was 60 days, the court found there was no jurisdiction to start with.

Now, I have had that happen not once, but at least four to six times.

Now, each of these times has been where the State has found there was no jurisdiction. They did not require the permit in the first place. But the body of jurisprudence that is embodied in the 1977 act is shocking to an attorney, and it is shocking to a citizen, if he understands it.

I associated the firm of McGuire, Woods & Battle in Richmond—you have probably heard of them. They are one of the finer law firms in the East. Supposedly, I was associated with the finest constitutional lawyer in the firm. He has since become a district judge, as a matter of fact. The group of attorneys from the firm that read the act could not believe that it had become law in the United States. I admit to you, 15 years ago when I was in law school, I wouldn't have believed it if somebody told me that this would become law in the United States. The burden of proof is on the defendant, as has been mentioned, to prove that he is not guilty. As to paying fines, you have the cessation order without a hearing. Now, people say, well, that is necessary to prevent abuses to the land. You have to have that right to issue that cessation order. The judges are not that busy. You can get a 24-hour hearing and go before a judge and get a temporary restraining order, if it is necessary. There is no need that a cessation order be issued by the inspector without some kind of judicial oversight.

The problem that occurs is the cessation order is issued and then supposedly the act says that temporary review hearing, temporary relief hearing will be held within 5 days. By the time the operator gets the office of the attorney, gives him the facts, the attorney draws up the papers, mails them in to OSM, they go through the mail, you are likely, if it is 2 days, generally closer to 5. and there is always some weekend time in there. I believe the quickest I have ever been offered a hearing is 12 days from the time I mailed out the papers.

Senator **Warner**. Any of those problems going to be addressed in the regulatory form? I don't expect to be an expert in the detail you are addressing difficulties. Would you care to specifically comment on the regulations or perhaps you have done it already through your various clients, and in that series of comments you could address this area. The basic thrust of this hearing, while it is an oversight hearing, I made clear in the opening statement there is no disposition in the U.S. Senate today to begin to move forward to amend, in some respects, been advised that any of the points of procedure have been changed. istration in the regulatory reform area and your comments to the committee today can be most helpful in that vein. If you care to supplement your comments today with further observation, I will be pleased to receive them and put them in the record.

Mr. **Street**. All right, sir. I will not dwell then on the specifics of the act. I am not that familiar with the reform action to date. I have not been advised that any of the points of procedure have been changed. I do not know about that.

Senator **Warner**. I would suggest at your earliest opportunity you determine that, because therein is where we are trying to work out equitable relief.

Mr. **Street**. Mr. Chairman, I will reflect then on a couple of areas that I have had discussions with OSM. As a matter of fact, I went to Washington on one occasion and talked with them on some other occasions, and I don't think any change is going to be made, and that is the point I was trying to make with my example of the ill-fitting suit, and it concerns the 2-acre exemption and the roads. I think that possibly some people at least may not understand the reason for the tactics used in the 2-acre exemption and the roads. The tactic was not to thwart the legislation as much as to stay alive.

I submit to you that if these tactics had not been used, if the litigation had not been carried on that has been carried on for the last 3 years, the coal industry would be in a bankrupt situation in Virginia. It was done intentionally to try to gain time until a new administration came along, or until hopefully, Congress would see the light and see the mistake it had made. If Congress doesn't see the light in the near future, I don't think the coal industry is going to be able to exist in the Appalachian region. I don't know about the other regions. I am not wise enough, and I don't have experience, I don't know what goes on there, but I do know about the Appalachian region. I do know if the act is enforced as written with the regulations, especially on the haul roads, mining cannot exist in Buchanan County. You can't build a road.

One of the experts for OSM testified as to how a road could be built without pushing spoil over the downslope. After he testified, it was obvious that he couldn't figure out a way. There is no way to do it. The reason for dedicating those roads to the county was because OSM, DMLR, and every reasonable citizen realized they can't comply, but when you start trying to get around it, then suit is brought immediately by the environmentalist group so-called and OSM then can't continue on with what we want to do. Again, that is a problem in not repealing the act, particularly as to deep mining, because they are never going to be able to improve the regulations to where it is going to be what it should be.

I submit that we ought to face facts from the beginning. It was a bad act in its inception. It is a bad act in its application, and it is never going to be a good act. Virginia has had an exemplary surface mining program and deep mining program prior to 1977. It has an exemplary act now, and I think it was very pertinently pointed out by you, Mr. Chairman, that the 2-acre exemption arose because of the act. It was taken care of before.

I would like to point out also that the industry—and I have worked on it many days myself—has worked diligently trying to put a program back in regulating 2 acres or less in Virginia. But it is not something that is done overnight.

Senator **Warner**. We are going to need your help on that and the help of others as we get deeper in the 2-acre situation.

Mr. Harris assured me that he is going to be patient about it and say it very carefully before they come out with a proposed regulation.

[The prepared statement of Mr. Street follows:]

September 2, 1981

The Honorable John Warner, Chairman
Energy & Mineral Resources Subcommittee
Senate Energy & Natural Resources Committee
Washington, DC 20510

Re: Surface Mining Control and
Reclamation Act of 1977 (1977 Act)

Dear Senator Warner:

I was born and raised in Buchanan County, Virginia, in the heart of Virginia's mining industry, and have practiced law at Grundy, in Buchanan County, Virginia, since January, 1971. Since the 1977 Act was passed, I have been involved in approximately 37 cases arising out of the implementation of the 1977 Act and Regulations. You should also know that I am a conservationist. I have built my home in a relatively remote area of woodland on the top of a mountain in Buchanan County, Virginia. My family are all enthusiastic campers. My sons and I are avid hunters and fishermen; in fact, our family reaps its greatest enjoyment from the out-of-doors. My house is built on the top of a ridge near the Grundy airport, and surface mining has been conducted on both sides of the ridge where I live, the highwall on one side being within 200 feet or less of the side of my house. The view from the entire length of my house overlooks a pre-1977 surface mining bench. I built my house there approximately four years ago at a time when the road was not paved and there was no public water. The sole reason for building at the location is to live in a natural setting where my children can play in the woods and learn the peace and quiet of nature. I make these comments so that you will know that I have experienced surface mining in my front door and in my back door; that I have experienced disadvantages of blasting and coal haulage in front of my house within 100 feet of my front door and so that you will know that I do love the out of doors. I hope you will consider my lifestyle as you read the remainder of my comments. It is my confirmed conviction that the Surface Mining Control & Reclamation Act of 1977 is unwise, counter-productive, and wastes our resources. Do not consider my observations and comments to extend further than the area where I live and have observed. Since I am from Virginia, I am not sufficiently wise or knowledgeable to suggest proper methods, regulations and laws for mining in Wyoming, Oklahoma, Montana or any other part of the United States.

A. MAJOR OBJECTIONS TO THE ACT:

I perceive at least three major objections to the 1977 Act. It amounts to excessive regulations; it is inflexible; and it is an unjust and unfair law.

I. EXCESSIVE REGULATIONS:

(1) The 1977 Act's primary aim in Southwest Virginia is to prevent pollution of the streams by sedimentation and acid runoff as well as preventing erosion and slides. A number of agencies, both State and Federal Goverments, are attempting to accomplish the exact same purpose. As an example, a deep mine in Southwest Virginia has at least six different regulators relative to its water runoff; the EPA, the Corps of Engineers, OSM, VDMLR, the Virginia State Water Control Board and the local Circuit Court which enjoins companies on the basis of complaints by the State Health Department, the County Health Department, the Virginia Commission of Game and Inland Fisheries, and the complaints of private citizens. Obviously it does not require control by this many agencies to regulate water pollution or sedimentation runoff. Many miners complain that various agencies have different requirements and often the mine operator faces the delimma of trying to satisfy different agencies who have conflicting requirements and specifications.

(2) The permitting requirements of OSM are unbelievably complex and burdensome. It requires approximately six to twelve months in Virginia just to secure a mining permit. A certification by civil engineers, hydrologists and other experts is required on the various plans required to be submitted with the permit application. Some of the mining companies have estimated that it costs between $50,000 and $75,000 just to complete the permitting process before any mining is commenced. The permitting requirements are so complex that the mine opertor who has been in the business for many years is unable to understand or satisfy such permitting requirements, without the assistance of experts such as hydrologists and civil engineers. Historically, civil engineers have been difficult to find in Southwest Virginia and hydrologists are almost non-existent. The result is that the small mining companies are unable to provide the expertise to file for the permits; and, therefore, are only able to secure permits by using the services of the full-time paid staffs hired by large coal companies. The larger coal companies have been required to employ numerous personnel just to obtain a permit. The Committee might discuss this matter with VDMLR if it wishes to learn more about the complex permitting requirements and red tape resulting from the 1979 Act's requirements.

II. 1977 ACT IS UNJUST AND UNFAIR:

If criminals were subjected to the same procedural rules, regulations and provisions as are included in the 1977 Act, the whole country would raise a hew and cry. The Civil Liberties Union would have every court in the mining areas deluged with court cases.

(1) In one of the cases in which I was involved the owners of the surface and underlying mineral, one of whom was a widow, wanted to have their coal mined by the deep mining method. Due to the

particular topography of the land it was impossible to construct a road within the 1977 Act's grade or without placing spoil on the outslope and still reach the high elevation of the coal seam. The only value of the land, other than the minimal value of the timber which had been previously cut, was the mineral beneath the surface. The owners leased their coal to a mine operator who altered a preexisting road to the coal seam and began mining the coal. OSM issued a cessation order to stop mining on the property, even though the majority of the road used by the operator had been used for many years for previous mining and timbering. The previous mining was terminated several years ago, but most of the road was still being used for timbering. So long as the road was being used for timbering there was no problem, but once the road was scraped and used for coal hauling, the road violated the 1977 Act, and therefore OSM stopped the mining.

It is difficult for a citizen to understand the justice of a law which permits a man to build a road for timbering, to reach a house, or to develop property but does not permit his neighbor to build a road in the exact same manner to mine coal. Furthermore, it is difficult to accept the 1977 Act which prevents construction of roads exceeding certain percentage of grade even though it is impossible to build such roads on the mountains of Buchanan County which range from 20 to 35 degrees. Even the Virginia Department of Highways is unable to construct its roads in conformity with the grade requirements of the Act or the prohibition against placing spoil on the downslope. In a recent hearing before Judge Williams the President of a road construction company who had previously constructed roads in Buchanan County for the State Highway Department testified that it was impossible to construct roads in Buchanan County on the mountains to comply with the requirements of the 1977 Act and Regulations. The Committee can corroborate this testimony by discussing the matter with the Virginia Highway Department officials who supervise the construction of roads in this area. The end result is that the 1977 Act makes it impossible to build roads to reach the coal seams in this steep mountainous area which are at a high elevation. As a result, if the regulations as to road construction are enforced, the owners of the mineral tracts will lose the value of their land without compensation even though other citizens build roads throughout the County to reach their land and without prohibition by any law.

(2) The bench areas remaining after land that has been mined in Buchanan County are generally worth $2,000 to $5,000 per acre. The reclamation of the land to the original contour depreciates the bench land from $2,000 to $5,000 an acre to less than $100 an acre. There is no compensation to the owners. The owners would much prefer to have their land left with a bench and highwall. In an area within 1,000 feet of my house, the authorities are attempting to require reclamation to the original contour of some land that had been mined. The owner of the land is extremely opposed to the action and wants

his land left in its present state because it is so much more valuable and beneficial. Under the 1977 Act the owner has no choice. The Federal Government has prohibited the owner from making his own decision as how to best utilize his land. It is interesting to note that the owner can push the spoil over the downslope and leave a bench and highwall if he does not remove the coal. Why does the Federal Government presume it is wiser than the individual owner to determine the most beneficial and wisest use of the land?

(3) Companies have been shut down without any judicial or administrative hearings even in cases where it is later determined that OSM had no jurisdiction or the violations alleged didn't occur. OSM Inspectors issue Cessation Orders without first performing surveys even when the State has determined that the disturbed area contains two acres or less and is therefore exempt from the 1977 Act. The operators subject themselves to tremendous fines and possible imprisonment if they continue to mine in spite of the cessation orders.

A contract miner and the lessor of the coal were issued cessation orders, and their operation was closed without any hearing because OSM alleged that the operator was allowing water to leak from under his sedimentation pond dam and had placed spoil on the downslope of the access road. The operator advised the inspector at the time the inspector gave the Notice of Violation that the water was not leaking from the sedimentation pond but was leaking from an abandoned deep mine behind the pond. The inspector paid no attention to the operator even though the operator subsequently lined the dam with plastic, placed straw on the outside of the dam and performed a dye test to prove to the inspector that water was not escaping from the pond. After the operator contacted me and after I filed injunction proceedings in Federal Court and after a review hearing was scheduled before an Administrative Law Judge, OSM vacated the violation. Of course, by this time the lessor had been shut down for two weeks, had expended considerable attorney's fees, and was almost bankrupted as a result of the lost profits which he urgently needed to make installment payments on an indebtedness of several million dollars obtained for the start up of the mining operation. There had been no need for a cessation order because the small amount of water that was leaking from under the dam was in no way dangerous even if the water had been leaking from the pond. Furthermore, the Virginia DMLR had previously considered the mining operation to be excluded from the 1977 Act's jurisdiction because it was less than two acres.

In another OSM case in which I was involved, the operator was issued cessation orders and repeatedly required to regrade and compact the outslope and in the process disturb previous seeding, and forced to undergo protracted litigation in the administrative process even though the Administrative Law Judge later ruled that the operation was less than two acres and OSM had no jurisdiction. OSM had assessed fines exceeding $40,000 even though the mining operation had extracted less than 3,000 tons of coal.

I recently read an opinion rendered by the Interior Board of Appeals in which a permittee had filed an injunction proceeding in the State Court to have a coal company who had been trespassing on the permitted area evicted. The facts were that the trespassing company had continued to disturb land in violation of the 1977 Act and the permittee coal company had approached OSM in an effort to have the trespassing company stopped. OSM advised it was unable to take any action. Finally, the permittee coal company resorted to the State Court to request an injunction against the trespassing mining company. Subsequently, OSM issued Notices of Violation against the permittee for the disturbance committed by the trespassing coal company. The Interior Board of Appeals sustained OSM's position and held the permittee liable for the actions of the trespassing coal company even though the Board admitted in its opinion that the results were unjust and unfair.

I reviewed another decision of the Interior Board of Appeals in which a property owner had negotiated for over ten years in an attempt to find a mining company that would mine his land and reclaim it in conformity with his specific demands for the future development of the land. To carry out his development plans, the property owner contracted with the permittee mining company to reclaim the land in a specific manner set forth in the contract to facilitate such a development. The 1977 Act was enacted after the contract was negotiated and executed. OSM directed the permittee to restore the area in conformity with the 1977 Act, i.e., to the original contour even though such restoration violated the permittee's contract with the property owner. The Interior Board of Appeals ruled in favor of OSM's position and held that the permittee mining company was required to restore the land to its original contour even though it would be in contravention of its contract and the express wishes of the property owner who was primarily interested in the development of his land for its best use after the completion of mining.

(4) Citizens who are in the process of farming, timbering, building houses or any of a number of activities can disturb land and build roads in a manner that mine operators are prohibited from doing under the Act. There is no concept of due process or equal protection. The same area can be cleared and leveled for farming that cannot be cleared and leveled for extracting coal. On two different occasions I have had clients who wanted to take off knolls on their farm and asked me what they would have to do in order to remove the coal underneath. In both instances I have advised the men that they would spend more money in trying to get a permit than they would recover by selling the coal. My advice was to cover the coal up or push it over the mountain but not to remove it and sell it. Even though the area was less than two acres, the roads used to reach the property would have exceeded two acres. Timbering companies can

construct roads into timber areas and not be subject to the Act. However, as soon as a mining company begins to use the road and scrapes it, the area is then included in the mining permit and the mine operator has the obligation to maintain the road. In many, many instances in our County mining operators have merely scraped and put gravel on roads that have been existing for many years only to find that OSM contends they then have the responsibility for total maintenance of the roads. A man can cut a road all over the mountain on any grade to build a house, a hunting cabin, or go hunting but he can't cut such a road to mine coal.

III. THE 1977 ACT IS INFLEXIBLE.

The 1977 Act was drafted to regulate all mining activities throughout the United States. The Act covers mines in Wyoming, Montana, Illinois, West Virginia, Pennylvania, etc. However, the mining methods, the terrain, the needs of the industry, and the needs of the environment are different in each area. It is impossible to draft one set of rules or regulations which will properly and wisely dictate proper environmental controls and at the same time proper land use in every State in the Union.

(1) The 1977 Act requires that all land be returned to the original contour. This requirement may be fine for land in Montana or Illinois that is level. However, the terrain of Southwest Virginia, especially Buchanan and Dickenson Counties, is very steep, and it is environmentally unsound, prohibitively expensive, and a waste of our land to return the mined area to the original contour.

Restoration to the original contour depreciates land from approximately $2,000 to $5,000 an acre to $100 or less per acre. The restoration to the original contour in our steep mountainous area invites erosion and slides that cannot properly be prevented even by compaction and seeding. The previous method of leaving the bench and highwall was a much wiser method to conserve our land. The bench area satisfied many urgent needs of this area. We have limited level land for our people to build homes; in Buchanan County alone, several thousands of men work in the mines but are forced to travel from adjacent counties due to the lack of building space. We have very little level land for agricultural use. The farming specialists at V.P.I. have done extensive studies in this area over the last six years or longer and have concluded that the benches left after mining produce a higher yield than the National average of many crops and are ideally suited for farming. You can fly over the area and see many reclaimed benches being used for grazing cattle and growing crops of various kinds. I am sure you have heard the many stories of the schools, airport, houses, etc., that are built on the reclaimed bench area.

Advocates of the Surface Mining Act often contend that the restoration to the original contour is beneficial for wildlife--in our area, this is simply untrue. The Sportsmen's Association in this area holds annual tours in an attempt to show people from other areas how beneficial the bench areas are to wildlife. The local Sportsmen's Club has planted various seed producing and nut producing bushes and trees, and the wildlife has increased substantially in our County.

One of the most obvious examples of the effect of surface mining before and after the Act can be seen on the mountain where I live near the Airport in Buchanan County, Virginia. Three methods of surface mining exist side by side. One side of the mountain was surface mined prior to the 1977 Federal Act and the other side of the mountain is being presently surface mined pursuant to the 1977 Act. On the side mined prior to the 1977 Act, part of the area was properly reclaimed in accordance with the Virginia law then existing and part of the area was not properly reclaimed according to the then existing Virginia law. In the pre-1977 reclamation, there are many acres of level land that have been replanted in grass and are ideally suited for housing and farming. The area that has been reclaimed pursuant to the 1977 Act is so steep that it is dangerous to walk on it is eroded; and it is worthless for any purpose of which I am aware. It is a perfect example of the result in Virginia of the ridiculous requirement to restore the land to the original contour which in effect requires the operator to spend many thousands of dollars in additional monies to put the land in a condition that often depreciates its value tremendously and renders the land unfit for any purpose. The sole possible accomplishment of the requirement for the return to the original contour in this specific area is that people who are not used to seeing highwalls are pleased because they now see the graded, steep mountain. Restoration to the original contour is not an act of conservation. At most it may be a very expensive act of beautification to some people.

(2) The 1977 Act requires roads to be cross-barred and re-seeded once the mining operations are completed. Yet, I read or heard recently that many thousands of dollars have been or are being expended in Virginia to open up fire trails to reach remote areas to protect against the spread of forest fires. Every twenty to forty years, lumber companies harvest the timber in this area; in fact, the lumber industry was the primary industry in our County prior to the development of coal. In spite of the need to keep roads for fire protection, timbering and access to areas for homes, the 1977 Act blindly requires the roads to be left in such a condition that they cannot be useful.

OSM requires all roads to be built with less than certain maximum specified grades without placing spoil on the downslope. These construction criteria are possibly applicable to mining roads in Illinois, Wyoming, etc.; however, such requirements are impossible in Buchanan County and surrounding areas of Virginia. If the spoil is not placed on the downslope, it would have to be transported and placed at other sites. The last section of U. S. Highway Route No.

460 constructed in Buchanan County was almost impossible to complete because there were no available sites upon which to dump the excavated material. Even though the State Highway Department has certain exemptions under State law in reference to dumping material on the banks of streams, three injunction actions were filed in the local court against the Highway Department to stop construction on the grounds that the dumping might interfere with a stream or waterway.

When building a road on a 20 to 35 degree slope it is necessary to have a bulldozer make a first cut on the side of the mountain, which action automatically pushes spoil over the downslope. The draftsmen of the Act obviously did not consider or have knowledge of the basic engineering steps in constructing roads in steep terrain. The 1977 Act and Regulations concerning construction of roads have caused insurmountable problems in mountainous mining areas. If the Act and Regulations prohibiting spoil on the downslope of roads is diligently enforced, there will be no future mining roads built in Buchanan County. The Act is not flexible enough to take into account the specific terrain and mining conditions of this County.

(3) The 1977 Act requires that sedimentation ponds must be installed at each mining operation and all surface runoff must be passed through such ponds. In many situations, deep mines pump no water from the interior of the mines and sedimentation ponds are often unnecessary. Some of the mines are constructed so that the work areas slope into the mine and no appreciable surface runoff occurs. In this area deep mines are placed on the side of steep mountains and as much area is often disturbed to construct a sedimentation pond as was disturbed in the beginning to put in the mine.

I have been involved in two OSM cases wherein the mining operation was terminated and the area was reclaimed and reseeded. In each case the inspector still required a sedimentation pond to be constructed to catch surface runoff. In one specific case, the operator had installed a sedimentation pond but had removed the sedimentation pond when he reclaimed the land prior to the seeding. To have again constructed a sedimentation pond would have required the mining operator to disturb additional land that had never been disturbed in order to catch surface runoff allegedly coming over seeded and reclaimed land. The total area involved was approximately two to three acres. The Committee would be well advised to further investigate this issue with VDMLR, which also believes that in some situations there are better alternatives than sedimentation ponds.

(B) RESULTS OF THE 1977 ACT

As a result of the excessive regulation engendered by the 1977 Act, the inflexibility of the 1977 Act, and the unjustness of the 1977 Act, many harmful results are now obvious. The 1977 Act was reputedly designed to conserve our natural resources. It is a sad paradox that the 1977 Act has in fact squandered many resources in Southwest Virginia.

(a) The requirement to return the land to the original contour has squandered valuable bench land which could be used for homes, agriculture and wildlife preservation as previously mentioned.

(b) The requirement to crossbar and reseed roads prevents the use of the roads for access to remote areas for timbering, fire prevention, etc., without further road improvement.

(c) The waste resulting from the 1977 Act in capital and lost coal is astonishing. The expenditures required to conform to the Act both as a result of the excessive paperwork, permitting requirements, road construction and water impoundment requirements and the restoration to the original contour requirement combine to deter mining in this area. In 1975 there were 321 new surface mine permits issued in Virginia. In 1980 there were only 42 surface mine permits issued in Virginia. The simple truth is that the cost of complying with the Act is so high economically and emotionally that the coal cannot be profitably mined in Buchanan County by surface mining except in a very few locations. The result is that we will lose considerable coal that will not be mined, and we will also lose the valuable land that can be produced on the benches if mining in these areas were still economical. Our County cannot afford either of these losses. If you accept my contention that restoration of the original contour is not the wisest use of the land in our County, then you must realize that the tremendous expenditure of money necessary to satisfy this requirement is also an unnecessary waste of our resources.

(d) Due to the red tape of permitting, the complexity of the Regulations, the continual changing of the requirements, our local mining industry has suffered a tremendous loss in mining expertise. The fact of the matter is that many mining operators have thrown up their hands and quit because they would not continue to mine due to the trauma and strain of the regulatory scheme and the harassment resulting from the program. I reviewed the first few OSM files in which I was involved and immediately recognized four names of operators who are no longer in the business. I know that at least three of the four operators quit the mining indicated because of the headaches, harassment and risk of the paper work, permitting program, inspection, and liability.

(e) The 1977 Act has effectively destroyed any semblance of competition in this area because the small operator is no longer able to compete. The extended time necessary to secure a permit, the complexity of the permitting process, the requirement of endorsement by experts on the permitting documents, the large amount of capital expenditure required to secure the permit, and the threat of exorbitant fines and penalties all combine to effectively deter the small operator from doing any mining except as a contract miner for a large company. In a recent conversation with a very successful independent miner he advised me that he would not even consider leasing a block of coal and mining it on his own due to the 1977 Act. This man is an intelligent miner with a college education who has been very successful but is unwilling and unable to mine on an independent basis as a result of the 1977 Act. Large companies have effectively acquired a monopoly on the coal reserves as a result of the Government's regulations. The small coal operator that employs eight to ten men can mine much more efficiently than the large operator. Since the small operator can no longer mine independent blocks, he must mine on the lease of the large operator, and the large operator sells the coal and sets the price to the purchaser. Almost without exception the formerly small independent operators are now contract miners for large coal companies with little bargaining power to control the payment they receive for their coal production. The 1977 Act has damaged the economic status of the small independent operator and has increased the price of coal to the nation not only as a result of the increased costs of mining but also because the small operator is no longer in a position to lease coal and sell it directly to the purchaser.

(f) The 1977 Act, instead of protecting the environment as intended, often results in considerable additional land being disturbed for sedimentation ponds even where the sedimentation pond is not necessary and the sedimentation control could be better accomplished by some other remedial action. Further damage to the environment results from return to original contour requirement.

A. REMEDY

I submit that the only effective remedy to correct the unjust and ill considered 1977 Act is to rescind it, certainly as it concerns deep mines in Virginia. The average deep mine in Virginia, I would guess would not exceed five acres of disturbed land. The effect on the environment is minimal except for mines that pump out large amounts of acid water. The emission of acid water is controlled by EPA, the State Water Control Board, VDMLR, and the local court which is prompt to issue injunctions at the request of the other state and local agencies previously listed as well as at the request of private citizens. The regulatory scheme of the 1977 Act in its original concept was primarily to apply to surface mines, and its attempted application to deep mines has proved to be an unmitigated failure. In 1980 there were only 3,000 acres disturbed in Virginia by both deep and surface mines. Except for the discharge of polluting waters, one wonders how much environmental damage can result from the disturbance of 3,000 acres split into small parcels throughout the entire coal mining region of Virginia.

1. OSM

To continue the 1977 legislation and expect OSM to modify the regulations will not solve the problem. OSM is a bureaucratic octupus that is not content to implement the Act as written but has taken on itself the cloak of environmental wisdom and has repeatedly attempted to regulate beyond the intent of the Act. OSM has attempted to exercise jurisdiction over mining sites that disturb two acres or less in controvention to the express provision of the 1977 Act. For example, OSM has at one time or the other attempted the following: (1) Consider as disturbed area all area over which any water drains from the mined area; obviously this would include all land between the mine site and the ocean to which said water eventually drains; (2) consider as disturbed area all area overlying deep mines, even though the surface is never touched, on the grounds that such area may possibly subside; (3) to include as disturbed area all area disturbed by either the permittee or the lessor of the permittee at other sites regardless of the distance between the sites on the ground that the permittee and the lessor are one association; and (4) include as disturbed area all the area of any roads over which coal is hauled from the mine even though such road or roads may have been in existence for many years and used for many other purposes. Obviously, OSM is attempting to regulate all mines by one theory or another. Another example of OSM's attempt to extend its jurisdiction beyond that contemplated by the 1977 Act is shown by OSM's attempted regulation of all processing plants even though the 1977 Act in the interim program applies only to processing plants at or near a mine site. OSM has taken the position that processing plants should be considered at or near a mine site even where the mine site may be 20 to 30 miles distant from the plant, which in effect includes all processing plants.

OSM is intimidated by the threats of many environmental groups. At the first sign that OSM is attempting to carry out any action contrary to the interest of the environmental groups, the organizations threaten suit and adverse publicity. Inherent in such threats is the possible loss of jobs to the OSM officials responsible. This effectively quells any action by OSM to make the 1977 Act more flexible and fair.

In the first hearing in which I was involved before an Administrative Law Judge, the Solicitor for OSM advised me in advance that he considered the mine operators to be the enemy of OSM and he assumed that the mine operators considered the OSM to be their enemy. In such a regulatory atmosphere where the battle lines are drawn by the regulators who consider the industry an enemy, there can be no objective and impartial consideration of what is fair and equitable. The great majority of mining operators are interested in proper mining and reclamation procedures. As in all professions and industries there are mavericks who do not properly reclaim the land or protect the environment during the mining process. However, it is both unfair and unwise to persecute the entire industry because a few of the operators are irresponsible. Any regulatory scheme should be directed at the irresponsible operators, not at overregulating and harassing the responsible operators. So long as the regulatory agency considers the industry its enemy, the industry will consider the Federal Government as its enemy. The 1977 Act contemplates OSM to be a police force, and OSM has carried out that function.

(2) STATE REGULATION

Virginia has been a leader in modern reclamation control and environmental protection in the mining industry. A view of mined areas that have been reclaimed prior to the 1977 Act, but pursuant to the Virginia law, indicates how effective Virginia's reclamation program was prior to the 1977 Act. The Virginia regulations took into consideration the local terrain and the local environmental requirements and prescribed a program of environmental protection and reclamation which conserved all of our resources, including our land, our environment, our coal, and our mining expertise. I would not attempt to tell the officials of Illinois how to regulate their mining industry, and it is beyond my comprehension why legislators outside of Virginia wish to dictate to Virginia officials how to regulate the mining industry within the State of Virginia. The people and government of Virginia are entitled to determine the best and most productive use for their land. The 1977 Act is similar in principle to a government regulation dictating how much concrete and/or pavement is permissible per acre of land in New York City. Concrete and/or pavement used for driveways, roads, shopping centers, etc., prevents water from being absorbed in the ground, causes accelerated runoff, removes and prevents vegetation and resulting oxygen production, to name a few of the environmental harmful effects. However, I would certainly hope that the Federal Government would not be so presumptuous as to enact legislation concerning concrete and pavement limitations. In the same respect, the citizens of Buchanan County and Virginia are sufficiently intelligent, wise and interested in the welfare of the State to protect its environment and conserve its resources. The philosophical basis of our Federal system is to permit each state to regulate its local industry and land.

Respectfully submitted,

E K Street

E. K. Street

Senator WARNER. I am wondering if I could now hear from the other members of the panel. You are very helpful on these points, but we have run into a time block. Mr. Wampler and I have got to cross the ninth district and meet with another group here on a different subject matter here before the day is out, and I have to be in Richmond tonight and open a conference at 9 in the morning. In the meantime, the Newport News Shipbuilding has got a problem I have to solve between now and 10 tonight.

Mr. HUNTER. I want to tell you something privately after this that might be beneficial to you.

STATEMENT OF ROGER JONES, CHIEF ENGINEER, PARAMONT MINING CORP.

Mr. JONES. In an effort to conserve time, I will limit my comments to one comment, and have my written comments entered into the record.

My name is Roger Jones and I am chief engineer with Paramont Mining Corp. I am personally responsible for permit applications for surface and deep mining for Paramont Mining Corp.

There is only one thing that hasn't been mentioned today that needs to be brought to your attention and that is section 502(b) which requires essentially repermit all existing surface and deep mining operations within 2 months of an approved State permanent program.

Gentlemen, this is the single most expensive item which now faces the coal operators of this State and Nation.

My request is to change this section of the act to apply only to new complete application permits rather than all existing operations. This single change could not affect any environmental standards. It would save an untold number of operators hundreds of thousands of dollars.

It would also keep the State inspectors from being lured away to coal companies to accomplish their paperwork; needless effort, in my opinion for existing operations. Thank you.

[The prepared statement of Mr. Jones follows:]

P.O. Box 800
Wise, Virginia 24293
(703) 679-4200

September 1, 1981

Senator Warner and
Honored members of Senate Sub Committee

Re: Hearing at Southwest Virginia Community College
September 2, 1981

My name is Roger Jones, Chief Engineer with Paramont Mining Corporation, and I would like to take this opportunity to thank each of you for holding this hearing in SW Va. and for allowing me this opportunity to comment on P.L. 95-87 and its numerous regulations.

My comments deal with many topics, law, and regulations and are not necessarily in priority order.

My first comment deals with the new administration's approach to the regulations termed "as effective as". I know in accordance with what I have seen so far that this is a sound and common sense approach to the many complex issues involved in the regulations. I know the Commonwealth of Va. has proposed several alternatives which OSM will reconsider for approval. The proposed future rulemaking calendar which OSM has published will allow us additional time to comment on items such as haul roads, hydrology, and excess spoil.

My second comment has to do with the Act's requirement under Section 502(d) to essentially re-permit all existing surface and deep mining operations within two months of an approved state permanent program. Gentlemen, this is the single most expensive item which now faces the coal operators in this state and nation. My request is to change this section of the Act to apply to only new complete application permits rather than all existing operations six months or older. This single change would not affect any environmental standards. It would save an untold number of operators hundreds of thousands of dollars. It would also keep state department inspectors from being lured away to coal companies to accomplish their paperwork; a needless effort, in my opinion, for existing operations.

My third comment has to do with "AOC" or Approximate Original Contour. Many areas are extremely hard to return to AOC from the performance standpoint. AOC sounds good to the ears, but gentlemen we need the flat benches for future growth and the roads for future access. The last ten to twenty feet of highwall is hard to return and dangerous for operators. Since AOC has been in effect I've seen many walls reclaimed to a useless purpose when the flat areas could have been utilized for pasture, farming and/or residential sites. Also, there could be possible future sites for surface or small deep mine operations.

My fourth comment, similar to AOC, has to do with second cut operations on old existing walls and/or benches. OSM has essentially forced the states, thus the coal operators, to an AOC operation rather than utilized maximum extent possible "mep" on covering old walls. To maximize recovery of many seams which are not mineable by the deep mining method, then mep should be encouraged.

My fifth comment is on groundwater hydrology. According to the Act in Section 507(b)11 the operator must determine probable hydrologic consequence of mining on quantity and quality of groundwater and the regulatory authority must determine the probable cummulative impacts of all anticipated mining. This is an extremely difficult task. In this area we have perched water tables, cracks, fault zones, and few if any zones which might be called true acquifer.

Under Section 515(b)10 the operator is required to minimize disturbances by appropriate operation activities.

Under Section 517(b)(2) water use becomes the primary consideration and in accordance with preamble comments specifies circumstances when groundwater monitoring becomes mandatory. This section to me is the most appropriate and should allow OSM and this state to reach very minimum monitoring requirements. To my knowledge no study has shown that mining practices of the past or present has degradated groundwater to the extent that groundwater has been not useable or potable. I urge that regional groundwater studies be considered.

My sixth comment has to do with the controversial less than two acre operations. I think the two acre operation is still needed for medium and large operators as well as for small operators. These operations aid in the recovery of coal that would otherwise not be mined either by the surface or deep mine method.

My seventh comment has to do with stability considertions. To include stability analysis requirements in all backfill areas is mostly useless paperwork. This was not an interim regulation requirement and unless documented need can be established, I believe this requirement should be deleted from Virginia's permanent program.

Again, thank you gentlemen for this opportunity to comment.

Senator **Warner**. Thank you.

Thank you, gentlemen, for your very balanced and forthright observations on this situation.

If there are no further comments by this panel—is there anyone else in the audience that desires to speak to this issue? If not, I thank one and all.

The record will be left open for 2 weeks for the submission of further written testimony and statements.

I would appreciate it if you would address them to me in care of the Senate Energy Committee in Washington, D.C.

I again thank my distinguished colleague, the senior member of the congressional delegation, for joining in and participating in this hearing today of the Senate Energy and Mineral Resources Subcommittee, and also the very able work provided by both the majority and minority counsel of the subcommittee.

Ladies and gentlemen, there is one individual who has worked tirelessly here for 7½ hours, without even a luncheon break, and that is the reporter. Madam Reporter, I would like to give you a hand. [Applause.]

[Whereupon, at 3:45 p.m., the hearing was adjourned.]

APPENDIXES

APPENDIX I

Additional Material Submitted by Mr. Harris

DISPOSAL OF EXCESS SPOIL FROM COAL MINING AND THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977:

A STUDY OF REGULATORY REQUIREMENTS, ENGINEERING PRACTICES, AND ENVIRONMENTAL PROTECTION OBJECTIVES

A Report Prepared by the
Committee on Disposal of Excess Spoil
Board on Mineral and Energy Resources
Commission on Natural Resources
National Research Council

National Academy Press
Washington, D.C. 1981

NOTICE

The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the Committee responsible for the report were chosen for their special competences and with regard for appropriate balance.

This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

The National Research Council was established by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and of advising the federal government. The Council operates in accordance with general policies determined by the Academy under the authority of its congressional charter of 1863, which establishes the Academy as a private, nonprofit, self-governing membership corporation. The Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in the conduct of their services to the government, the public, and the scientific and engineering communities. It is administered jointly by both Academies and the Institute of Medicine. The National Academy of Engineering and the Institute of Medicine were established in 1964 and 1970, respectively, under the charter of the National Academy of Sciences.

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PREFACE

Early in 1980, at the request of the Office of Surface Mining (OSM) of the U.S. Department of the Interior (DOI), the National Research Council (NRC) established a 15-member Committee on Disposal of Excess Spoil (CODES) under the Board on Mineral and Energy Resources within the NRC Commission on Natural Resources. The two chief tasks of the Committee were to review current methods for disposal of excess spoil (overburden produced during surface mining operations and waste rock excavated during underground mining operations) and to analyze the regulatory approach adopted by OSM for such disposal and for other environmental protection practices.

In responding to this sensitive charge, the NRC gave careful consideration to the composition of its Committee. It was apparent that a broad range of skills and experience would be needed--in geology, in environmental science and engineering, in industrial processes, in state government, in the law, and in relevant federal agencies. Asked to serve as Committee chairman was Frank Kottlowski, a leading economic geologist and specialist in coal geology with extensive experience in state government, first with the Indiana State Geological Survey and later with the New Mexico Bureau of Mines and Mineral Resources. Committee Vice Chairman Kenneth Weaver, Maryland State Geologist, Chairman of the Maryland Land Reclamation Commission, and Director of the Maryland Geological Survey, brought additional experience in state government to the task along with knowledge of surface mining and reclamation operations, particularly problems of disposal of waste. John Borovsky, a specialist on soil and vegetative aspects of mined land reclamation, provided additional experience with mining operation regulations at the state and federal levels. Eugene Farmer, hydrologist and forester, is with the U.S. Forest Service. He is experienced in watershed management and spoil stability and revegetation. Edwin Herricks brought the viewpoint of the ecologist to bear on the Committee's deliberations. He is a specialist in environmental impacts of resource development, including reclamation of water and aquatic systems polluted by mining operations. Arvid Johnson, an engineering geologist, brings to the Committee expertise on geotechnical properties of earth materials and slope stability problems. George Land, an executive with the AMAX Coal Company since 1964, supplied perspective on technical aspects of mining and marketing and their impacts. Gerald McLindon, former Dean of the School of Environmental Design at Louisiana State University and now an environmental design consultant, is a landscape architect and structural engineer with long experience in the design and construction of earth structures, and in the design of landscapes for productive postmining use. Monroe Newman is Chairman of the Economics Department at Pennsylvania State University and a specialist in economic assessments of impacts of mining operations in urban and regional contexts. Harry Perry, an expert on energy economics, was an active participant in a number of earlier NRC study committees. His wide experience in the coal research field is constantly drawn upon by the scientific, technical, and science policy communities. Thomas Sawarynski, Southern Appalachian Regional Manager for Engineering and Environmental Affairs of the Consolidation Coal Company, provided the Committee with first-hand experience in geotechnical engineering of spoil disposal sites and dams. Attorney Karen Shaffer provided a review of the legislative history of the Surface Mining Control and Reclamation Act and analyses of regulatory alternatives to it. Jack Simon, of the Illinois Geological Survey, is an expert on coal geology and one of the country's most knowledgeable and active participants in ad hoc and permanent committees on energy and the environment, including the Illinois Commerce Commission Inter-Agency Fuel and Energy Board and the Task Force on Midwest Energy Requirements and Environmental Protection, which he chaired. Geomorphologist Stanley Schumm of Colorado State University has served as an environmental consultant and as the principal investigator on numerous projects for federal agencies, including the U.S. Army Corps of Engineers and the Federal Highway Administration. Eric Walther, an expert on air pollution and its sources, directs the Visibility Research Center at the University of Nevada.

The first meeting of the Committee was held in Washington, D.C., on June 17-18, 1980. In addition to dealing with organizational matters, the Committee heard statements from representatives of governmental agencies and private organizations with an interest in the methods used for the disposal of excess spoil.

A second meeting was held in Beckley, West Virginia, on October 16, 1980, following 2 days of visits by Committee members to coal mining operations in eastern Kentucky and western West Virginia. In addition to giving Committee members an opportunity to observe the results of past and current coal mining and excess spoil disposal practices, the field trip enabled the Committee to discuss the subject with coal company officials, environmental groups, and personnel from state and federal regulatory agencies.

The Committee also examined numerous documents in preparing this study. The most important of these were Public Law 95-87--the Surface Mining Control and Reclamation Act of 1977 (SMCRA)--and the legislative history of that law; the draft and final Environmental Impact Statements prepared by OSM; the regulations promulgated by OSM under authority of SMCRA; and transcripts of congressional hearings and congressional committee reports dealing with coal mining and the reclamation of land disturbed by such mining, together with numerous technical publications on engineering methods and professional practices. Statements made at the first meeting of the NRC Committee on Surface Mining and Reclamation (COSMAR) in June 1978 also were helpful, as were interviews with present and former federal officials who were involved in the preparation of the interim and permanent regulations on excess spoil disposal issued by OSM under the authority of the 1977 Act.

Disposal of excess spoil from coal mining operations has heretofore been of concern in some parts of the country, but it has been a major problem chiefly in the Eastern (Appalachian) Coal Region. In the future, however, disposal of excess spoil could become more common in the western states, as increasing demand for coal encourages additional surface and underground mining operations in the West. This report addresses the matter of excess spoil disposal throughout the conterminous United States. However, the Committee's review has been structured to deal with the excess spoil regulations, and because they mainly address Appalachian problems, the study unavoidably focuses somewhat more on this region than on others. There is no discussion of excess spoil disposal in Alaska, because that topic is explored in depth in a 1980 NRC report entitled Surface Coal Mining in Alaska.

ACKNOWLEDGMENTS

The Committee on Disposal of Excess Spoil (CODES) acknowledges the assistance of numerous individuals and organizations in conducting the CODES study. The Committee appreciates the statement presented at the first Committee meeting by representatives of the Office of Surface Mining (OSM), Bureau of Mines, U.S. Army Corps of Engineers, Solicitors Office of the Department of the Interior (DOI), Board of Surface Mining and Reclamation Appeals of the DOI, Mine Safety and Health Administration of the Department of Labor, Interstate Mining Compact Commission, American Mining Congress, National Coal Association, Center for Law and Social Policy, and Environmental Policy Institute.

The Committee is grateful for the information supplied in response to its request by state regulatory agencies, state and federal land management agencies, university departments, coal companies, engineering consultants, highway departments, governmental construction agencies, local and national environmental groups, and various private, not-for-profit associations and research groups. Many of the respondents contributed significantly by preparing detailed documented answers to questions on standards and regulations, known and anticipated environmental impacts, engineering practices and alternatives, and related matters.

Karen A. Shaffer, a member of the Committee from its inception until her resignation on February 2, 1981, described the legislative history of Public Law 95-87--the Surface Mining Control and Reclamation Act (SMCRA) of 1977--for the Committee and clarified undocumented parts of it by interviewing people who had been involved in its development. The interviews also disclosed interpretations, perceptions, and pressures current at various stages in the enactment of SMCRA and the establishment of OSM and its regulatory programs, that is, between the spring of 1977 and March 1979, when the permanent regulations were published in the Federal Register. These interviews were important to the Committee in gaining an understanding of the perceptions that helped shape the regulations. Richard M. Hall, legal consultant to the Committee, also assisted the Committee by supplying additional information and many citations and references. The Committee is indebted to the following interviewees: William Eichbaum, former Associate Solicitor, Division of Surface Mining, Office of the Solicitor, DOI, now Assistant Secretary, Environmental Programs, Maryland Department of Health and Mental Hygiene; Jerry Dodson, former Senior Staff Attorney, Division of Surface Mining, Office of the Solicitor, DOI, now Counsel, Subcommittee on Health and Environment, U.S. House of Representatives Committee on Energy and Commerce; Hope Babcock, former Deputy Assistant Secretary for Energy and Minerals, DOI, now attorney with Blum and Nash, Washington, D.C.; George H. Davis, former Assistant Director--Mineral and Water Resources, U.S. Geological Survey, DOI, now a private consultant; Charles A. Beasley, former Associate Director, OSM, now Assistant Director, Abandoned Mine Land Program, OSM; Michael Robinson, Geologist, OSM, Charleston, West Virgina; Jack Spedero, Supervisory Reclamation Specialist, OSM, Logan, West Virginia; and Michael Superfesky, Supervisory Reclamation Specialist, OSM, Clarksburg, West Virginia.

In October 1980, the Committee spent 2 days visiting coal operations in eastern Kentucky and western West Virginia to examine spoil-handling methods and structures. The field examinations were considerably enhanced by the active participation of state agency officials and field staff, company personnel, OSM field and headquarters personnel, and representatives of environmental groups. Committee members benefited immensely from an aerial view of mining in steep terrain, which was made possible by a helicopter flight provided through the courtesy of the West Virginia Department of Natural Resources.

The Committee thanks Charles F. Cook, Vice President, American Mining Congress, and William E. Hynan, Senior Vice President, National Coal Association, for their role in arranging for several coal companies to supply cost data and estimates for use by the Committee. This involved working out uniform assumptions and definitions so that the methods and figures would be comparable and would accommodate the Committee's objectives; it also required the design of a procedure for submitting the information to the Committee through the accounting firm of Coopers and Lybrand, to preserve the confidentiality of proprietary information. The Committee's thanks are also extended to the cooperating companies.

Chapter 1

SUMMARY, FINDINGS, AND RECOMMENDATIONS

Surface mining of coal is generally more economical, safer, and more efficient than underground mining, but it can disturb the land both at mine sites and at nearby places where excess spoil--overburden that is not returned to the mine workings after mining is completed--is deposited. In the absence of proper land reclamation, surface mining and the improper disposal of excess spoil can accelerate erosion, pollute water, and damage property. It can also contribute to flooding, impairing the aesthetic value of landscapes and diminishing the usefulness of the land.

The objectives of the study of the Committee on Disposal of Excess Spoil (CODES), as described in the request from the Office of Surface Mining (OSM), were to conduct a nationwide review of engineering practices and physiographic and environmental conditions that have an impact on the disposal of excess spoil from surface and underground mining of coal and to evaluate the rationale for promulgating OSM regulations in the form of general guidelines, detailed engineering standards, or a combination of both. OSM regulations are promulgated under the authority of Public Law 95-87, the Surface Mining Control and Reclamation Act (SMCRA) of 1977.

Decisions about these regulatory options could affect not only excess spoil regulations but also regulations dealing with hydrologic balance: sedimentation ponds, coal-processing waste banks, coal-processing waste, and roads related to mining activity, as well as other regulations where design standards (regulation of practices) are used.

On the basis of its findings, CODES makes a number of recommendations with respect to the regulatory program for the disposal of excess spoil and the other environmental performance standards of the Act. The recommendations, in brief, are as follows:

- The regulatory program should be goal oriented and should adopt certain minimum mandatory performance standards.
- Field-oriented technical assistance units should be established to make the benefits of basic and applied research available to coal producers and to provide advice on technical problems of excess spoil disposal and other problems related to environmental protection standards of the Act.

- Regional guidelines should be established so that regulatory standards are applied with due consideration for the different geologic, climatic, and terrain conditions of the various coal regions.
- Baseline data should be collected on a regional basis to assist in carrying out the regulatory program.
- Any regulatory staff involved in the regulatory process should have appropriate scientific and engineering expertise and professional licenses or certifications for carrying out the regulatory program.
- Economic incentives should be considered as a way of improving operator performance and encouraging innovative practices in the disposal of excess spoil.

These main recommendations are discussed in more detail in the following pages of this summary and in the body of the report.

1.1 REGULATORY ISSUES

To fulfill its responsibility, OSM issued interim and permanent regulations, but the regulations have resulted in controversy and litigation. OSM requested the CODES study in order to obtain an independent evaluation of the rationale for promulgating regulatory standards, especially those related to excess spoil disposal practices.

There is a range of regulatory and other methods available for controlling mining activities, including the disposal of excess spoil and the use of mined land. These alternatives include providing technical assistance; providing economic incentives; regulating results (by using performance standards); regulating practices or means (by using design standards); and finally, allowing public ownership of surface rights (see Section 5.4.1).

SMCRA's provisions controlling the environmental effects of surface coal mining are called Environmental Protection Performance Standards, but the Act and OSM regulations rely primarily on design standards and design criteria. Design criteria are specific engineering or other parameters required to be met. The design criteria in the Act and the regulations do not specify the methods to be used to achieve them; however, in most cases they apply uniformly without regard for regional or site-specific conditions.

The reader should note that the term "performance standard" is frequently used incorrectly. In this report, performance standard means regulation of results.

1.1.1 Historical Background of Excess Spoil Disposal, the Act, and the Regulations

The legislative history indicates that land disturbances caused by surface mining were seen as a national problem that required a federal solution, and Congress developed detailed standards to ensure that surface mining did not result in environmental degradation and diminished land-use capabilities (see Section 3.3).

Although most excess spoil disposal problems currently occur in Appalachia, this report deals with excess spoil from surface and underground mining throughout the conterminous United States.

Before regulation by the states and the federal government, spoil in hilly areas, where coal seams crop out on steep slopes, had often been disposed of by casting it downslope. The practice led to soil erosion, landslides, stream pollution, impediments to reclamation and revegetation, and other detrimental conditions. Information gathered during the study indicated that small operations were particularly insensitive to needs to prevent environmental damage, ensure safety, and anticipate postmining land use.

In 1967, however, an alternative method of mining and excess spoil disposal--mountaintop removal and head-of-hollow or valley fill--was developed in West Virginia. By this method, coal is extracted after the removal of all overburden, and a level area is thus created where a mountaintop had been. The resulting excess spoil is deposited in hollows and valleys adjacent to the mountain, a process that creates additional level land (see Section 3.1).

SMCRA addressed the problem of disposing of excess spoil by requiring the following: transport of the spoil and placement in a controlled manner in position for concurrent compaction to ensure mass stability and to prevent mass movement; removal of all organic material from the disposal site; construction of appropriate surface and internal drainage systems; placement of the spoil on the most moderate slope available; formation of a rock-toe buttress where the toe of the spoil rests on a downslope; and a final configuration that is compatible with the natural drainage pattern. The Act also states that the design of a spoil disposal facility must be certified by a professional engineer in conformance with professional standards (see Sections 3.2 and 4.2).

Excess spoil disposal was one of the last problems addressed in formulating the Act; it was dealt with after mountaintop removal was incorporated in the developing legislation as an acceptable mining technique that could result in worthwhile postmining land uses.

While the legislative history guided OSM toward the use of design standards and criteria in its regulations, no specific direction had been given in the Act as to whether the standards and criteria should be general or specific, and mandatory or nonmandatory, although there were suggestions for adopting a specifically worded approach. To fulfill its responsibility, OSM chose specific design standards and criteria, or regulation of practices, rather than general performance standards, or regulation of results (see Section 3.2).

OSM regulations are more detailed than the spoil disposal requirements in the Act, and in many cases they prescribe specific construction procedures and criteria that often ignore the diversity of site conditions recognized in the Act itself (see Sections 3.3 and 4.2).

The task force that drafted the regulations for OSM was made up of specialists from various federal agencies, and the drafting of both the interim regulations and the permanent regulations was done under the pressure of statutory deadlines. On the basis of the legislative history, OSM interpreted the Act as giving public safety and health and environmental protection priority over other considerations. This interpretation required adjustment of the mining operation to the environmental protection standards rather than adjustment of the standards to the operation; that is, uniform standards would have to be met that would not vary from operation to operation.

An important criterion for determining the form of the regulations was OSM's concern for effective enforcement, a concern that favored explicitly worded design standards and criteria over the adoption of more general standards. On the basis of information presented to the Committee, the record of past abuses in the coal mining industry led to regulations designed to ensure the stability of spoil structures by requiring adherence to rigid design standards and criteria. The industry's efforts to reduce costs and increase profits were seen by OSM as working against the primary concern for protection of human health and safety and environmental quality. In addition, the legislative history indicates that the technical backgrounds and experience of personnel in the coal mining industry, the professional engineering fields, the state regulatory agencies, and OSM were considered by Congress and OSM officials to be less than adequate to meet the demands of the Act (see Section 3.3.3).

OSM has maintained that its regulations allow for flexibility, but they do so only by granting exceptions in the form of variances to specific requirements rather than by enabling establishment of requirements on a site-by-site basis.

1.1.2 Statutory Requirements and Regulations

The Act established a rigid framework for setting regulatory standards for excess spoil disposal and other environmental protection standards and a schedule for developing the regulations that turned out to be unachievable.

The detailed requirements for excess spoil disposal contained in §515(b)(22) of the Act are very specific; many appear workable, although some impose limitations on the nature and form of OSM regulations (see Section 4.2). The inclusion of specific engineering standards and criteria in the permanent regulations restricts the use of sound alternative techniques appropriate to some sites, but some of the regulatory requirements are mandated by the Act itself. The Act also includes a requirement that the "design of the spoil disposal area is certified by a qualified registered professional engineer in conformance with professional standards." These considerations suggest that the framers of the Act and OSM were concerned that registered professional engineers might not properly design or certify the design of disposal structures.

Because specific engineering requirements in the OSM regulations ignore the wide range of site-specific conditions, it is not possible to state categorically whether the Act and the regulations represent overdesign or underdesign.

The emphasis on design standards and criteria raises the possibility that the required mining practices may result in extra costs for some operations without the commensurate social, safety, or environmental benefits sought by the Act (see Sections 4.2 and 4.5). In designing an excess spoil structure, a balanced consideration in terms of safety, environmental protection, and cost effectiveness in the design is necessary. If an engineer is not allowed to use innovative designs to achieve a safe, environmentally sound, and cost-effective product, he is denied the use of the best available technology and cannot improve on current techniques (see Section 4.2).

The Committee does not know of any massive failures of excess spoil fills constructed according to OSM regulations, although the experience with the regulations is short, dating from 1978. The ultimate stability of these fills is, however, unknown.

A reevaluation of the methods and procedures designed to ensure that the purposes of the Act are met, using information and viewpoints of all parties involved, should be considered.

1.1.2.1 Excess Spoil Disposal Regulations The Committee's assessment of the specific provisions of OSM regulations governing disposal of excess spoil from surface coal mining, which are equivalent to those for excess spoil and development waste generated from underground coal mining, can be summarized as follows (see Section 4.2):

- When excess spoil materials can be used for other purposes outside the permit area, such uses should be permitted and encouraged. Degradation of surface and ground water should be prevented (§816.71(a)). The water leaving a mining operation should be similar in quality to that of the watershed, but stricter standards may be appropriate where increased pollution from other sources occurs. The effluent limitations prescribed in the regulatory program that are required by EPA and enforced by OSM do not take into account the fact that the natural quality of the water may be worse than the prescribed limits. Ensuring that the disposal pile is suitable for reclamation and revegetation is a positive step in mitigating environmental impacts (§816.71(a)).
- Requiring fill designs to be certified by a registered professional engineer and approved by the regulatory authority is a sound regulation (§816.71(b)).
- The removal of all vegetative and organic material from the disposal area, although required by §515(b)(22)(B) of the Act and §816.71(c) of the regulations, may not be necessary in all cases.
- Slope protection to minimize surface soil erosion is an accepted practice in fill construction (§816.7(d)).
- The use of the most moderate slope available for spoil disposal sites, although required by §515(b)(22)(E) of the Act and §816.71(e) of the regulations, should be dictated only where stability analyses show other sites to be unsafe or incapable of meeting the environmental standards of the Act. The use of a natural terrace, bench, or berm for excess spoil placement should be viewed with caution as these sites may have unstable foundation conditions (§816.71(e)).
- There will be conditions where excess spoil must be placed in lifts (layers of material) and compacted to achieve stability.

However, methods of spoil placement other than layering in thin lifts with mechanical compaction can also achieve mass stability. However, on the basis of the legislative history, the Act's requirements for excess spoil disposal were initially interpreted to prohibit dumping from the mining bench and to allow only hauling or conveying the spoil in constructing the fill. Subsequently, the permanent regulations (§816.74) and amended interim regulations included a provision allowing for dumped placement of excess spoil material made up of 80 percent durable rock under appropriate site-specific conditions (see Section 4.2.4).

End-, side-, or perimeter-dumped fills can be designed and constructed to meet a 1.5 safety factor (the ratio of forces resisting failure to those leading to failure) in all regions of the country, but some specific sites may make end-, side-, or perimeter-dumping unsuitable. Under appropriate conditions, end-, side-, or perimeter-dumping could be used to achieve stable fill structures when coupled with construction of a "dam" at the toe of the fill by reworking the spoil material and compacting it into layers. This operation would be expected to provide the necessary stability to hold the dumped fill material behind it in place. The material dumped behind the dam would be concurrently compacted by gravity. This concept needs to be tested, and this could be done under the Experimental Practices provisions of the Act and the regulations. The decision on the construction method at any one site can be best made by a professional engineer experienced in spoil dump design.

In general, a long-term static safety factor of 1.5 is reasonable, although it may not be necessary in all cases. It should be determined analytically prior to construction. There should be a variance allowed from the requirement for a 1.5 safety factor if the stability analysis and design parameters are clearly conservative and adequately allow for the consequences of possible failure. Probability analysis and risk assessment could help in developing safe designs, and the feasibility of using these methods for developing performance standards for excess spoil embankment stability should be investigated (see Sections 4.2.1 and 7.5.2). The upper portion of the spoil dump should not be compacted, in order to help support the vegetation being established on the fill surface. There should not be an absolute prohibition of water impoundments on all fill areas (§816.71(f); §816.71(g); §816.72(a); §816.72(c)).

- The final configuration of the fill in terms of postmining land use should be discussed and arrived at by the mine operator and the owner of the land, provided that the spoil has initially been placed in accordance with the provisions of the regulations and the purposes of the Act (§816.71(g)).
- The use of terraces to control erosion and to contribute to stability is an accepted practice. Grading of terraces no steeper than 5 percent could produce scouring velocities in some cases. The regulations should consider runoff velocities and allow other techniques, such as low berms, in stabilizing fill tops and terraces (§816.71(h); §816.72(e)).

- A 36 percent slope requirement necessitating keyway cuts or rock-toe buttresses is too arbitrary. Slopes shallower than 36 percent may require buttresses or keyway cuts, although some steeper slopes may not (§816.71(i)).
- Inspection of all phases of spoil-fill construction is appropriate (§816.71(j)).
- The regulatory requirements under which coal-processing wastes can be placed in excess spoil fills other than head-of-hollow or valley fills are proper (§816.71(k)). Because such wastes would be generally similar to much excess spoil material under these requirements, their placement in all fills should not be prohibited as long as structural stability is assured and water quality is protected. The Act does not specifically exclude disposal of coal-processing wastes in fills of excess spoil, but §515(f) requires that standards applicable to coal waste piles be developed. Removal of all organic material from the area of disposal immediately prior to spoil placement is required in §515(b)(22)(B), but this requirement is understood to refer to removal of soil, vegetative, and other organic material in the foundation of the fill disposal area for the purposes of structural stability.
- Drainage requirements for excess spoil fills can best be determined by the professional engineer designing the structure. Appropriate drainage systems other than the required durable rock underdrains in the regulations should be permitted if they meet the objectives of the Act. There are several methods for handling surface runoff, and the project engineer can design the system best suited to a particular site. Directing drainage away from the outslope is accepted practice. Where spoil material is suitable, the drainage equivalent of a rock-core chimney drain or a durable rock underdrain can be achieved through perimeter dumping (§816.71(l); §816.72(b); §816.72(d); §816.72(f); §816.73; §816.74).
- The regulation requiring stability of foundations and abutments and sufficient testing and investigation is appropriate (§816.71(m)).
- The return of excess spoil to underground mine workings is desirable, but may not be possible in many cases because of high cost or for other reasons (§816.71(n)).
- A recognized gradient for fill outslopes is 50 percent, but the nature of the spoil material may make a lesser or greater slope desirable and practical (§816.72(g)).
- The durable rock-fill provision in the regulations provides a sound fill construction technique (§816.74).

1.1.2.2 Regulations Regarding Hydrologic Impacts In general, the regulations concerning diversion of surface runoff and stream channels seem reasonable and workable. However, water effluent limitations, which are established by EPA and enforced by OSM, may not be realistic. They take no note of the fact that background water quality may be worse than the limits specified by EPA. Regional water effluent standards or appropriate site-specific criteria would be a more reasonable and flexible approach to protection of water quality than the current limitations. Sedimentation ponds are regulated by OSM by design standards, and these have met with much opposition. The regulations protecting ground water and streams or stream channels with a biological community from acid mine drainage or other sources of pollution are relatively straightforward and not controversial (see Section 4.3).

On the basis of the limitation for maximum allowable concentration for total suspended solids, most mining operations could be shut down during a 10-year, 24-hour storm event. Indeed, the amount of sediment currently found in many unmined watersheds, particularly in parts of Appalachia, exceeds the specified limit for suspended solids (see Section 4.3.1.3). Substantial portions of the OSM design requirements for sedimentation ponds have been suspended and are being reevaluated along with the new analysis of the effluent limitations by EPA. As changes in the EPA regulations are made, the OSM regulations, which track them, would be modified.

1.1.3 Environmental Consequences of the Regulations

On balance, the law and the regulations have had a generally beneficial effect on the environment (see Section 4.4).

In attempting to evaluate environmental benefits of the OSM regulations in comparison with costs imposed, CODES recognized that such cost-benefit analyses are extremely difficult to make. Environmental benefits generally do not lend themselves easily to quantification. Nevertheless, in any effort to determine the effectiveness of the OSM regulations, costs and benefits have to be kept in mind. Imposing coal reclamation costs in excess of those needed to achieve protection of the public and the environment reduces the competitiveness of coal in relation to other energy sources. Moreover, by prescribing certain practices, the regulations restrict the use of available technology and, perhaps more importantly, restrain the development of new methods. Thus the regulations have in effect frozen the technology of spoil disposal and other reclamation practices, preventing coal mine operators from improving their competitiveness. From the point of view of society, this could be the costliest aspect of OSM's regulatory approach (see Section 4.5).

Possible adverse environmental impacts on a site-specific basis as a result of following SMCRA and OSM regulations could include increased air pollution; increased soil erosion and stream sedimentation; reduced soil productivity, particularly under acidic soil conditions, and increased stream sedimentation in the handling of topsoil; and short-term adverse impacts from areas being disturbed during road construction. Stream diversions at a mining site may disturb a large area and thus have an adverse influence on wildlife, soil erosion, and water quality. Removal of semipermanent impoundments after mining may adversely affect wildlife and aquatic life that have become established in the impoundments (see Section 4.4).

1.1.4 Costs Associated With Excess Spoil Disposal

With the help of the National Coal Association and the American Mining Congress, CODES obtained five sets of usable cost data through a third party. In each case the reporting company revealed actual costs of operating in compliance with OSM regulations and estimated costs of performing the same functions by using engineering alternatives that follow good engineering practices. The data indicated higher costs for compliance with OSM regulations than for the alternative engineering practices, as would be expected when hauldown transport and mechanical compaction are contrasted to downslope dumping and gravity compaction. Comparative costs were also calculated by D'Appolonia Consulting Engineers in a study done in 1979 for OSM.

One of the striking aspects of these cost figures is the range of differences between cost of construction practices under OSM regulations and cost of construction practices that follow alternative sound engineering principles. The range is from 6 to 71 cents per cubic yard of fill higher for the OSM procedures than for the alternative methods. The OSM costs are actual costs, whereas the alternative costs are calculated on the basis of proposed methods developed by the industry, as contained in the technical information that accompanies the data submitted by the companies. The technical basis on which these alternatives rest is described in Appendix A. CODES did not evaluate the appropriateness of the industry's alternative engineering practices for meeting the OSM regulations or the objectives of the Act. The study also shows that the incremental costs of the regulations are not uniform among companies or among areas. Some operations are affected more than others and experience incrementally higher costs. As a result, relationships in the industry are changed in the short run, and some operations and some areas and types of mining lose part or all of their ability to compete economically. These differences, plus the fact that the industry believes it can achieve the same objectives at less cost, using other technology, explain some--though not all--of the vigorous negative response of industry to the regulations (see Section 4.5).

1.1.5 An Alternative Regulatory Approach

CODES recommends that a regulatory approach be adopted that is goal oriented, adopts certain minimum mandatory performance standards, suggests nonmandatory guidelines, and encourages technological innovation. This would seem to require changes in the Act because it contains design standards. OSM should ensure that regulatory personnel are highly and specially qualified to review all plans submitted by mine operators and to enforce compliance with the regulations. Application of these regulatory concepts would benefit the nation more than the current method of regulation and enforcement, because they minimize the short- and long-term effects on the economic health of the industry (i.e., profitability), while providing equivalent environmental protection. CODES recognizes that there may be difficulties in assuring that such an approach is adequately implemented, but it is expected that administrative and oversight difficulties would be overcome. Regulatory programs incorporating these concepts have been adopted by the Mine Safety and Health Administration in implementing the Coal Mine Health and Safety Act and the U.S. Geological Survey, and are in the process of being implemented by EPA for the Resource Conservation and Recovery Act (see Sections 5.4 and 5.5).

A first step in carrying out the above approach would be for OSM to promulgate revised regulations in the form of performance standards that would apply nationwide. The new regulations would set objectives or results to be achieved rather than regulate specific practices (see Section 5.4.2). Engineering design plans developed by coal operators would be submitted for review and approval, and the required regulatory decisions should be made in a timely manner in order to be effective.

The regulations should for the most part contain administrative procedures to be followed so that it is known how the operator is to proceed in dealing with the disposal of excess spoil or other reclamation-related activity. Thus the focus is on the process that will be followed in issuing and enforcing permits and on the capabilities of administrators to carry out that process. The operator must show, to the satisfaction of the regulatory authority, that the operation will not have a significantly adverse effect on the health and safety of the community or on the environment.

CODES finds that such a regulatory policy is required to elicit the best technical responses in achieving the goals of SMCRA. The approach suggested by CODES incorporates protection of the environment and of public health and safety with flexibility concerning site-specific conditions. It also promotes technological innovation, thereby helping to avoid many undesirable short- and long-term effects on competitiveness within the coal industry and between coal and other energy sources. This approach should lead to more satisfactory relationships between OSM, the states, and the coal mining industry. Some of the more satisfactory regulatory programs have been those that concentrated on setting general goals coupled with flexibility and a sound process for decision making, rather than on specifying rigid, detailed design standards (see Section 5.5). In the area of environmental protection, where much of the technology is still in the experimental or developmental stage, both the regulatory agency and the operators being regulated need encouragement and opportunities to adopt newly emerging technology. An effective process for timely decision making is needed on both an operational and an administrative level to accomplish the goals of such a regulatory approach.

1.1.5.1 Technical Assistance Units CODES recommends that OSM establish technical assistance units to aid and to strengthen the regulatory activities of OSM and the states through feedback of technical information bearing on improving performance, and to be available to work with coal producers when they request assistance in dealing with technical problems of excess spoil disposal and other environmental protection standards of the Act.

The technical assistance units would make the benefits of basic and applied research available to mine operators, thus fostering the development of new technology; the experimental mining practices of the Act could be used to test this new technology.

The units should be field oriented, with staff and equipment adequate for making studies at operating sites. These units could also operate as research centers or laboratories to investigate reclamation problems not normally undertaken by other federal and state laboratories and in coordination with them (see Section 5.4.2.1).

OSM would not plan or design any spoil disposal or other facility. However, advice on technical matters dealing with SMCRA would be available to operators on request. The Small Operator Assistance Program (SOAP), or some similar program, could be expanded to provide financial assistance to smaller operators who do not have all the available expertise to comply with a performance-oriented regulatory approach.

The number of technical assistance units required should be determined by the distinctly different types of mining environments and regulatory problems. Eastern and western units might suffice, or eastern, midwestern, and western units might be needed. Although considerable differences exist within such broad regions, the technical assistance units would facilitate carrying out the regulatory functions of OSM and would promote interaction among OSM, state regulatory agencies, and coal operators on an operational level.

Each unit should be staffed by people with sound backgrounds in relevant scientific and engineering disciplines and economics and with practical experience in surface mining and civil engineering. The units should draw upon the advice of experts from industry, professional associations, academic institutions, the states, and the public at large. In order to function satisfactorily, the units should have advisory components who would be able to provide on-site technical guidance to both state regulatory authorities and mine operators (see Section 5.4.2.1).

The technical assistance units should be established with a special expertise for evaluating SMCRA's §515 standards and the regulations on the basis of experience with them and with the state of the art in applied engineering technology in the context of regional conditions (see Sections 4.2, 5.4.2.1, and 6.3 and Chapter 8).

CODES recognizes the importance of technical assistance, but also recognizes that such assistance would be only one component of OSM's several activities.

1.1.5.2 Regional Guidelines The first task of the units should be to determine the method of implementation of the revised regulatory performance standards in the context of regional conditions as well as those standards relating to data requirements for permit applications. The advice of state and other federal agencies, mine operators, local communities, and environmental groups should be sought in evaluating these standards and data requirements. Regional guidelines, which could be published as manuals, should be compiled by each technical unit to give mine operators regional design guidance and objectives for the construction of engineered structures and other environmental protection requirements to meet the national performance standards in a particular region. The guidelines would be based on the particular conditions within a given mining region. In essence, OSM would then have under one program a set of guidelines for each of the regions meeting minimum SMCRA and OSM regulatory standards that would be broad enough to accommodate the range of conditions within each region (see Sections 5.4.2.2 and 6.3.1).

1.1.5.3 Data Collection CODES recommends that each of the regional technical units should be the focal point for the collection of baseline data for its region (see Sections 5.4.2.3 and 6.3). The data should be collected to fill gaps and inadequacies in scientific and engineering information needed to implement and enforce regulations. An effective program of this kind would necessitate coordination with data collection programs by other federal and state agencies, regional research institutions, mining companies, professional associations, and technically knowledgeable individuals. The OSM data collection program would be expected to be more directly related to surface coal mining reclamation problems than other data programs and would be expected to focus on needed data that are not now being collected by other government programs. A program of data collection should be initiated as early as feasible, even if it is of limited scope.

1.1.5.4 Personnel and Training Essential components in achieving regulatory flexibility are the technical backgrounds and the adequate, but not excessive, number of regulatory personnel. These factors are of major importance in determining whether an operator's mining and reclamation plan, including site-specific design for excess spoil disposal structures, is capable of meeting the performance standards, and in monitoring field operations for compliance.

OSM could advise on minimum qualifications of state and federal inspectors and regulatory personnel responsible for reviewing and approving permit applications. At a minimum, CODES suggests that the regulatory staff should have adequate education in directly relevant disciplines coupled with related work experience. Regulatory staff involved in review of geotechnical designs should also have appropriate professional licenses or certifications. Special training could be provided to update these skills. The object should be to obtain a well-balanced staff composed of individuals who have field experience and a sound professional background. Compensation should be at a standard capable of attracting well-qualified people at the several levels of responsibility. Allowing well-qualified people to make decisions on the basis of individual judgment and discretion is another important factor in attracting and keeping qualified personnel and assuring high-quality performance (see Section 5.4.2.4).

To expand the level of training of field personnel in both state and federal agencies, OSM could increase its current training program and adopt some of the broad training and educational programs developed by other federal agencies and industry, ranging from short periods of on-site instruction and demonstration to courses at universities.

The provisions for excess spoil disposal in the Act require that a registered professional engineer be responsible for certifying the design of an excess spoil structure to meet the requirements of the Act. CODES encourages industry and professional associations to adopt training programs to update and improve the engineering and scientific skills of the personnel who plan and carry out mining operations related to SMCRA. CODES also encourages academic institutions to enlarge and update their engineering and scientific programs by integrating engineering, geotechnical, hydrological, geological, and other relevant scientific and engineering disciplines so as to provide the industry with personnel who have acquired the broad perspective that SMCRA and recent technical developments require. The coal mining industry and professional societies could work closely with educational institutions in the development of academic programs responding to the needs of the surface mining industry in dealing with problems of excess spoil and other environmental protection performance standards of the Act (see Section 5.4.2.4).

1.1.5.5 Economic Incentives CODES recommends that economic incentives be considered as a way to stimulate operators to improve their performance in meeting requirements of the Act for disposing of excess spoil. Incentives such as allowing lower bonding costs on subsequent operations when performance standards on an earlier project have been met in an exemplary manner might prove effective. Such incentives would also encourage the development of innovative practices in disposing of waste materials. In brief, performance could be enhanced without stifling technological development (see Sections 5.4.1 and 5.4.2.5).

1.1.6 Regulation Under Other Federal Acts

OSM's regulatory approach is in sharp contrast to that used by the Mine Safety and Health Administration (MSHA) in enforcing the Federal Mine Safety and Health Act, to that proposed by EPA in enforcing the Resource Conservation and Recovery Act (RCRA) of 1976, and to the U.S. Geological Survey's (USGS) procedures for regulating mining on federal lands (see Section 5.5), as well as other federal acts.

Regulation by MSHA is based in many cases on considerable experience. On the other hand, OSM failed to take advantage of many decades of experience in civil engineering procedures and methods that are relevant to the design of fills of excess spoil (see Section 8.5). There are technical uncertainties surrounding the control of hazardous wastes, but EPA is developing a goal-oriented regulatory program to control them even though there is not a completely adequate base of data and experience.

The Federal Mine Safety and Health Act of 1977, which amended the Federal Coal Mine Health and Safety Act of 1969, established a federal system of regulation that applies to every mine in every state. The 1977 Act provided for assistance to states in developing and enforcing effective state programs, although federal regulations take precedence where there is a conflict. The Act and its regulations were based on decades of Bureau of Mines experience with the mining industry, coal mining practices, mining technology, and health and safety problems. The Act's regulations were written with an understanding of the problems involved and an appreciation of the management capability of coal mine operators and the economic factors they must deal with. Standards were developed after consultation among industry, labor, professional associations, and federal inspectors. In certain critical areas, MSHA found it could regulate coal mine safety practices by requiring the submission of plans for such matters as roof control and impoundment structures. The information to be contained in each plan is specified in the MSHA regulations. In certain instances, standards of performance are set by regulation, leaving the safe design to the operator, with final approval by MSHA district managers. In many cases, MSHA finds it possible to work with the operators to achieve compliance with MSHA standards, which provide for an acceptable level of safety, usually without specifying mandatory design criteria. In some areas, it should be noted, MSHA regulations do contain design criteria (see Section 5.5.1).

In dealing with disposal of hazardous wastes, EPA identifies those wastes that are potentially hazardous and then sets standards for their generation and transportation applicable to owners and operators of facilities for waste treatment, storage, and disposal. RCRA authorizes state programs for regulating hazardous wastes through a process similar to attaining state primacy under SMCRA. Faced with the problems of specifying technical standards for the treatment of each type of waste and each type of terrain in which the waste is to be deposited, EPA has proposed regulations that replace design standards with a risk evaluation procedure on a case-by-case basis. In this performance-oriented approach an applicant for a disposal permit is required to submit a plan containing the information required by the regulations. The operator must show that the proposed operation would not have significant adverse environmental or health effects. This regulatory scheme is based on the philosophy that the best engineering judgments are made on a case-by-case basis and that a sound decision can be made by the regulatory authority about acceptable levels of risk given all the factors involved--the location of the disposal site, the nature of the hazardous substance, the treatment technology, the handling and storage methods, and the potential impact on the environment (see Section 5.5.2). It should be noted that in some other areas, EPA regulatory programs are based on design standards.

To aid state and federal regulators, EPA has written a series of guidance documents on the characteristics of hazardous wastes, disposal practices, and related matters. In addition, operators are provided with guidance in preparing permit applications in accordance with the latest technology of hazardous waste disposal.

The approach of the USGS in supervising oil, gas, and mining operations on federal land is as follows: federal regulations establish nationwide performance standards; they are then interpreted to apply more particularly to a district, commodity, or activity, while the "Notice to Lessee" stipulates requirements for the individual operation. The issuance of a lease is contingent on submission of a plan acceptable in all respects to the USGS. Compliance with lease terms, regulations, and orders is supervised by inspectors with appropriate technical backgrounds who are sensitive to the state of the art, to feasibility and practicality, and to expectations of the public that will be affected by the operation (see Section 5.5.3).

1.2 ENGINEERING PRACTICES AND ENVIRONMENTAL CONDITIONS

1.2.1 Amounts, Sources, and Types of Excess Spoil

The expansion in volume that occurs when overburden is excavated is responsible for the generation of much excess spoil, but characteristics of mining areas and the method of mining also contribute to excess spoil. Other sources of excess spoil are overburden from the first cut (box cut) in flat terrain, overburden from mining in steep terrain, including mountaintop removal, and waste from underground mines brought to the surface.

Data on the number and size of excess spoil disposal areas are difficult to obtain. For many operations, it serves no useful purpose to keep an account of spoil that is in excess of the amount replaced in mine cuts. However, one indication of such numbers is that 30-40 percent of permits issued in West Virginia are for mining plans where at least part of the mine spoil is to be placed somewhere other than in the mined area. Disposal areas can be as large as 31 million cubic yards.

Excess spoil includes a variety of geologic materials ranging from rocks like sandstone, limestone, shale, claystone, and siltstone to unconsolidated materials like sand, silt, clay, and soil. Most of the material is shale and sandstone.

In Appalachia, spoil consists mainly of sandstone with some shale, claystone, and limestone. In the Midwest, shale is the dominant rock, but limestone is generally more common than in the other areas. The coal beds of the West are mostly associated with shales and siltstones.

In the steep-slope areas of Appalachia, the surface mining methods used are mainly contour mining and mountaintop removal. Thus head-of-hollow and valley fills are often used to dispose of excess spoil. Surface mining in the flat terrain of the Midwest generally starts with an initial box cut, the spoil from which is placed in adjoining areas as excess spoil. In the Western Region, strip mining in flat or gently rolling terrain is predominant, but contour mining is done in mountainous areas.

1.2.2 Characteristics of Spoil and Spoil Disposal Areas

After a review of the characteristics of the coal regions in the conterminous United States, including geologic, physiographic, hydrologic, and climatic factors, CODES notes that excess spoil is common in Appalachia because of steep slopes, narrow valleys, high overburden to coal ratio, and inadequate room for spoil on mine benches. Potential areas of slope failures and slides are prevalent in Appalachia and in some areas of the Rocky Mountains because of the steep slopes, high rainfall, springs and seeps, potential for high storm volume, and generally high overburden to coal ratio; and there are minor or insignificant problems with excess spoil in the Midwest and in the gently rolling areas of the West because of flat terrain, thick coal seams (in the West), low overburden ratio, and flat-lying coal seams. In the Midwest, the main problem is associated with the initial box cut, the spoil from which becomes a permanent feature of the landscapes. These box-cut spoils, which can extend for great distances, have an impact on the topography and on aesthetic appreciation of the landscape (see Section 6.3).

Hydrologic conditions and susceptibility to erosion vary greatly in the coal-bearing regions of the United States. In areas of high precipitation and steep slopes in the East, the potential for mass wasting is greater than in the West. In the West the main problem is the sparseness of vegetation and the resulting high potential for surface erosion; maximum natural erosional rates occur in the semiarid regions, and wind erosion is an important factor in this process. In the western United States, the main problem is not the disposal of excess spoil, as it is in the East, but rather reestablishing stream channels and revegetating the surface of reclaimed land.

Reclaimed areas and areas where excess spoil is deposited should be geomorphically stable and as flat as practicable; in addition, the surface of the spoil should be designed to minimize the concentration of water, while still retaining enough water in the upper 6 ft of the fill for the vegetation.

Detailed site-specific information and data are required to plan and operate a mine. Determination of the properties of overburden, spoil, and areas where spoil is to be placed is essential to the geotechnical engineer's design of a safe and stable spoil area.

1.2.3 Environmental Impacts

The environmental effects that may be associated with improper excess spoil disposal are mainly water pollution, air pollution, land impacts, mass instability, and accelerated erosion (see Chapter 7).

Factors affecting water pollution from spoils are infiltration, surface runoff, and ground-water movement. The quality of runoff water is influenced by the mineral composition of the upper part of the spoil. The quality of ground-water systems is also influenced by spoil-bank composition. Minimum environmental performance standards to assure an acceptable chemical quality of water based on the natural quality of the receiving surface water system are needed (see Section 7.1).

Air pollution from surface mining may adversely affect human health, vegetation, and wildlife and reduce visibility. The air pollutants are mainly a result of the use of equipment that injects fine-grained particles into the air as well as engine exhaust gases.

Direct movement of spoil may be produced by wind and is dependent to a large degree on the moisture content of the spoil. The combination of the dryness of spoil in the Western Region and high prevailing winds deposits more particles in the atmosphere than are found in the moister areas of the Midwest and Appalachia. Although some information is available on the impact of spoil disposal on air quality, there is no evidence, pro or con, on the impact on the health of humans or on vegetation or wildlife. In any event, spoil disposal operations can be designed to minimize air pollution (see Section 7.2).

Among the land impacts associated with excess spoil disposal are impacts on erosion and sedimentation rates of the spoil, on the long-term productivity of excess spoil embankments, and on the land-use potential of excess spoil dumps (see Section 7.3). Erosion by water, which is usually the greatest problem, can disturb the land severely. The rate and severity of erosion are controlled by vegetation, soil, precipitation, and topography. The ultimate productivity of an excess spoil embankment in terms of timber and forage is as yet unknown; it is closely tied to soils formed on the spoil and to development of the edaphic qualities of the spoil. With the notable exception of embankments containing acid-forming constituents in the soil zone, it seems likely that long-term productivity will be similar to premine productivity (see Section 7.3.2).

Factors particularly relevant to long-term productivity of completed fill structures are that few are located where land uses other than pasture or forest would result, that plant communities change over time, and that high levels of site productivity require high levels of land management. Where coal mining and excess spoil disposal operations occur, it is important to decide which changes in land use are acceptable. The regulatory authority should develop the necessary staff and expertise to make sound judgments (see Section 7.3).

Impacts on fish and wildlife are directly related to the area of habitat disturbed by the excess spoil disposal, which also indirectly affects streams and adjacent lands. Short-term and sometimes long-term alterations in fish and wildlife resources can be expected (see Section 7.4).

The assessment of mass stability, mass wasting, and the consequences of failure of excess spoil deposits is related to two types of spoil movement that vary greatly in extent. If the volume of spoil that moves is large, massive failure of the embankment occurs. The resulting landslide is deep-seated and difficult to contain. Furthermore, deep-seated landslides can be transformed into rapidly moving debris flows that can travel large distances and cause severe damage. In contrast, surface phenomena, such as erosion, scour, shallow flow slides, and earth flows are surficial in nature and can be readily contained in sedimentation ponds (see Section 7.5).

Instability can occur because of inadequate engineering, variations in natural conditions, construction practices that vary from the engineering design, or human error. A relatively new approach to mass stability problems is based on probability analysis and risk assessment. The feasibility of developing performance standards for excess spoil embankment stability based on probability analysis and risk assessment should be considered.

The consequences of massive failures could include one or more of the following: danger to human life; erosion and sedimentation; alteration of fish and wildlife aquatic habitat; changes in water quality; and damage to stream channels and floodplains (see Section 7.5.2).

The expectation that excess spoil fills will be stable into the foreseeable future may not hold, even if they are constructed according to the most stringent requirements. The legal responsibilities involved in a failure long after mining and reclamation are not clear (see Section 7.5.5).

1.2.4 Engineering and Related Practices

The design and construction of fill structures require thorough site investigation, testing of spoil characteristics, and engineering and stability analyses (see Section 8.2).

Adequate drainage of surface and ground water in and near excess spoil embankments is necessary to achieve embankment stability. Present regulations specify that underdrains and lateral drains must be provided for valley fills, head-of-hollow fills, and durable rock fills whenever the disposal area contains springs, natural or man-made water courses, or wet-weather seeps. A rock-core chimney drain system may be used instead of an underdrain system for head-of-hollow fills. Other methods for achieving internal drainage deserve investigation and evaluation, including end-, side-, or perimeter-dumping fill construction (see Sections 4.2 and 8.3).

Planning is a necessary part of a successful reclamation program in which revegetation is but one essential aspect. Appropriate vegetative cover on an excess spoil structure enhances the infiltration and percolation of surface water in the upper part of the spoil fill, increases protection against wind and water erosion, helps abate air and water pollution, conserves soil, contributes to desirable postmining use of the land, and enhances the appearance of the area (see Section 8.4).

Some of the engineering aspects of the disposal of excess spoil from coal surface mining operations are similar to methods used in highway construction spoil disposal, rock-fill dam construction, and highway embankment construction. There is much variation among the state regulations affecting these operations, but, in general, highway waste disposal, highway embankment construction, and rock-fill dam construction are not subject to criteria as specific as those for disposal of excess spoil from surface mines. In general, the highway engineers are allowed to use a variety of methods of construction as long as designs are approved by a certified engineer (see Section 8.5). The durable rock-fill alternative permitted by an OSM regulation is based on experience with rock-fill dam construction.

A number of research needs related to alternative disposal practices, safety of excess spoil fills, information required for stability analysis, water pollution, air pollution, and impacts on land have been identified during the course of this study. Those needs have been compiled in Appendix B.

Chapter 2

INTRODUCTION

The Surface Mining Control and Reclamation Act (SMCRA) was enacted to ensure that in surface coal mining and reclamation operations the land would be restored to an environmentally sound "condition capable of supporting the uses which it was capable of supporting prior to any mining or higher or better uses of which there is reasonable likelihood . . ." (PL 95-87, §515(b)(2)). Among the many requirements of that legislation are "Environmental Protection Performance Standards," including provisions pertaining to the disposal of excess spoil, with which this report is concerned. "Performance standards" is the term used in the Act and the regulations, but it includes specific practices that must be followed.

Spoil is the broken rock, soil, and other material removed during mining to gain access to the coal. Excess spoil is the material that cannot be returned to the mining site in reclaiming it because of volumetric expansion and as a result of certain mining methods that are used primarily in mountainous terrain.

The Act contains general requirements (§515(b)(3)) applicable to mining in flat terrain or rolling terrain of gentle relief where "overburden and other spoil and waste materials removed in the course of the mining operation is more than sufficient to restore the approximate original contour . . . ." However, the more significant engineering and environmental constraints that have to be dealt with in constructing excess spoil structures occur in mountainous terrains.

Section 515(b)(22) specifies practices that must be followed for disposal of excess spoil associated with steep-slope (contour) mining and for disposal of large volumes of excess spoil generated by mountaintop removal mining methods for which restoration to the approximate original contour is not required. Most, if not all, of the overburden needs to be moved or "spoiled," and considerable amounts of excess spoil are placed in permanent disposal sites in nearby valleys or heads-of-hollows of valleys (Figure 2.1). The mined land is improved when mountaintop removal is accompanied by well-designed and well-constructed head-of-hollow fills and when beneficial postmining uses have been planned for the level land resulting from the mountaintop mining and excess spoil fills (see Sections 3.1 and 4.2.1). Reclamation by use of this disposal method can reduce adverse environmental impacts occasionally associated with other reclamation practices, such as

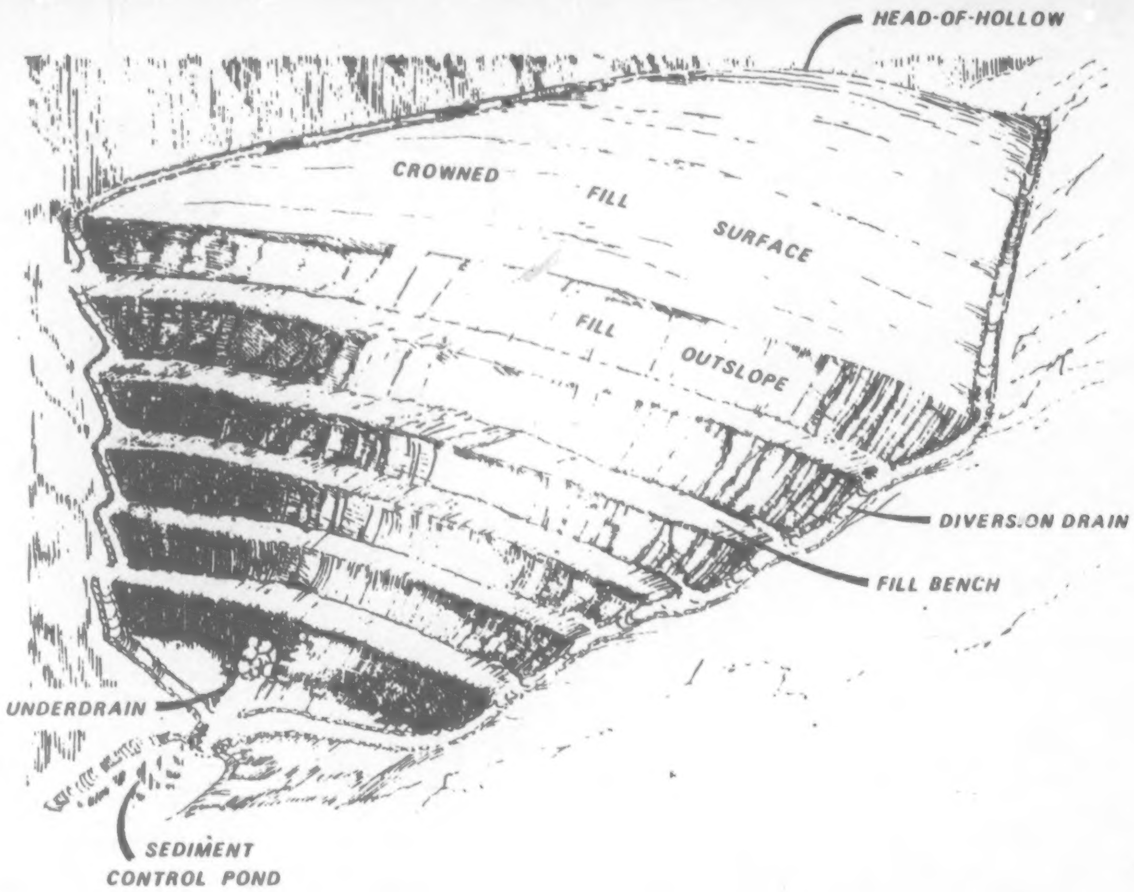
HEAD-OF-HOLLOW
CROWNED FILL SURFACE
FILL OUTSLOPE
DIVERSION DRAIN
FILL BENCH
UNDERDRAIN
SEDIMENT CONTROL POND

Figure 2.1 Sketch showing typical head-of-hollow fill structure.

Source: U. S. Environmental Protection Agency (1979).

contour regrading in steep terrain. The improvements include erosion and sediment control, spoil stabilization, and increased success in revegetation (EPA 1979; see Chapters 3 and 6).

The Office of Surface Mining (OSM) was created in the Department of the Interior to implement the provisions of the Act. In 1978, OSM issued interim regulations including those for the disposal of excess spoil. These interim regulations were succeeded by permanent regulations in 1979. In writing both the interim and the permanent regulations, OSM developed a stringent regulatory program to protect the environment and public health and safety in the form of very specific and detailed design standards regulating the practices that the coal operator must follow. Economic feasibility did not rank high among the factors considered in setting the standards.

The excess spoil disposal requirements are approximately as follows. The spoil is to be transported and placed with concurrent compaction in order to ensure mass stability. The organic matter in the area of disposal is to be removed immediately prior to spoil placement. The spoil fill is to be underlain by drains, and lateral drains are to be constructed from seeps and springs to the main drains. Surface drainage systems and diversion ditches are required to prevent spoil erosion and infiltration of water into the entire mass of the spoil. A vegetative cover, capable of stabilizing the soil surface to prevent erosion, is required. Other requirements are that the spoil be placed on the most moderate slopes, that the toe of the spoil fill be supported by a rock buttress if the toe is on a downslope, and that the final configuration of the spoil fill be compatible with intended land uses. In some cases the regulations provide for construction of a durable rock fill by end-dumping in a single lift (a layer of material) on a site-specific basis, but special approval by the regulatory authority is required. This method has not been extensively used but is expected to be used more in the future. Finally, the design of the spoil disposal area is to be certified by a qualified registered professional engineer in conformance with professional standards (see Chapter 4).

The regulations issued by OSM aroused considerable opposition, both from coal companies that believed that their economic well-being was jeopardized by the regulations and from the major coal-producing states, which saw the regulations as potential threats to the viability of the coal industry in their states and as an infringement of state authority by the federal government. The opposition mainly took the form of lawsuits filed by the companies and the states in attempts to demonstrate that the regulations were unreasonable because of their failure to take into account regional or local factors that made compliance difficult or impossible.

As a result, OSM asked the NRC's Committee on Disposal of Excess Spoil (CODES) to carry out an independent study composed of two tasks. The first task was to review both the engineering practices and the physiographic and environmental conditions that affect the disposal of excess spoil throughout the United States; the second task was to determine the form of the regulatory standards applicable to excess spoil disposal and to other portions of the regulatory program where design standards are also used, that is, to determine whether the regulations should contain general guidelines in the form of performance standards--regulation of results--or engineering specifications and criteria in "cookbook style"--regulation of practices.

OSM indicated that answers to these questions could affect practically every standard in the permanent regulations, especially those standards pertaining to "hydrologic balance: sedimentation ponds," "disposal of excess spoil," "coal-processing waste banks," "coal-processing waste," and "roads."

As it proceeded to carry out the second of its tasks, the Committee concluded that its work was applicable to the entire regulatory framework used in developing standards for environmental protection under §515. Hence the Committee's findings and recommendations should not be considered to be limited to the regulations pertaining to the disposal of excess spoil and the other parts of the regulations named above, even though it did not analyze all the other environmental protection regulations.

Although this study was requested and funded by the previous administration, it is being completed under the new administration that took office in January 1981. This administration has initiated a program of regulatory reform in the Office of Surface Mining, and the Committee recognizes that this report could be useful to OSM in this regard.

Chapters 3-5 of this report form Part I--Regulatory Issues--and Chapters 6-8 form Part II--Engineering Practices and Environmental Conditions.

Chapter 3 deals with the history of the issues at hand--the earlier attempts by Congress to deal legislatively with the disposal of excess spoil, the enactment of SMCRA, and the concerns of OSM as it wrote its regulations.

Chapter 4 quotes the OSM regulations pertaining to the disposal of excess spoil contained in §§816.71-816.74, presents the Committee's analysis of each of these regulations, and evaluates the costs of disposing of excess spoil. This chapter also analyzes OSM's regulations pertaining to the hydrologic impacts of excess spoil fills (§§816.43-816.52 and 816.67) and compares pre-SMCRA state regulatory requirements with the initial SMCRA regulatory requirements.

Chapter 5 presents an alternative approach developed by the Committee and includes brief discussions of the regulatory approaches used by three other federal agencies: the Mine Safety and Health Administration, the Environmental Protection Agency, and the U.S. Geological Survey.

Chapter 6, the first chapter in Part II, is a discussion of the characteristics of excess spoil and of excess spoil disposal areas, and of certain hazards in spoil disposal areas, such as land erosion and landslides.

Chapter 7 deals with the environmental impacts of excess spoil, that is, its potential effects on water, air, land, and fish and wildlife in the vicinity of the spoil. This chapter also touches briefly on the possibility that movements of excess spoil piles may endanger human life or have other unwanted effects on society.

Chapter 8 discusses engineering practices used in disposing of, and minimizing the environmental and other impacts of, excess spoil. In this chapter, special attention is paid to the design of spoil disposal facilities, to the drainage of excess spoil embankments, and to the revegetation of excess spoil fills and embankments.

Appendixes A and B contain information used during the study and research needs related to engineering practices and environmental conditions identified by the Committee, respectively.

Background information, in the form of Committee working papers, was assembled by the Committee during the course of the study on the following subjects: waste pile disasters at Aberfan, Wales, and Buffalo Creek, West Virginia (Working Paper I); the legislative history of SMCRA (Working Paper II); and regional characteristics of coal regions (Working Paper III). These working papers are on file as part of the administrative record of the study. They are available for examination in the Archives of the NAS, and copies of them can be obtained for appropriate charges (for reproduction, handling, and postage) through the NAS archivist.

REFERENCE

Environmental Protection Agency (1979) Environmental Assessment of Surface Mining Methods: Head-of-Hollow Fill and Mountaintop Removal. Interim Report. Prepared by Skelly and Loy, Engineers-Consultants, under Contract 68-03-2356. EPA-600/7-79-062. Cincinnati, Ohio: EPA Industrial Environmental Research Laboratory.

PART I: REGULATORY ISSUES

Chapter 3

HISTORICAL BACKGROUND

3.1 HISTORY OF SURFACE MINING AND SPOIL DISPOSAL

Surface mining is economically attractive and technically feasible wherever a mineral deposit of minable thickness lies under a relatively shallow cover of easily removable soil and rock (overburden). The quantity and quality of the recoverable mineral determine the income and profit available to pay for removing the overburden, for recovering and processing the mineral commodity, and for other expenses. The surface mining of coal is not fundamentally different from the surface mining of other mineral deposits as far as technology and economics are concerned, but non-coal-mining activities at any one site usually extend over a longer time span.

The two main operations in surface mining are excavation and transportation. In a brief history of the development of power shovels, Rumfelt (1968) notes that hand-digging plows and mule-drawn slip scrapers were reported to have been used for surface mining of coal near Danville, Illinois, in about the middle of the nineteenth century; in 1855 in the same area coal strip mining was done with a wooden dredge fitted with wheels for use on land, and in 1877 a steam shovel was used near Pittsburg, Kansas. According to Rumfelt (1968), the first true stripping shovel, that is, one designed specifically to meet recognized mining needs, began work in 1911 in the Danville, Illinois, area. Since then a wide variety of rugged and efficient machines--shovels, backhoes, draglines, front-end loaders, scrapers, and bucket-wheel excavators--have been built to meet the needs of different types of surface mining. Currently, there are dipper shovels capable of digging and loading 180 cubic yards (about 200 tons) of broken rock at a single bite and dragline buckets with a capacity of 230 cubic yards.

Transportation of large volumes of material is the second distinctive characteristic of surface mining. Barrows, carts, and wagons served in early operations, and trucks and railroads came into general use early in the twentieth century. The need of the mining industries for high-capacity and readily adaptable haulage systems to match the huge excavating equipment led to the development of a variety of transportation methods. Mine trucks commonly have carrying capacities ranging up to 170 tons; a 350-ton capacity truck is now being used in British Columbia, but it is the only one of its kind. Special conditions found at many deposits have fostered the development of belt conveyors, inclined skips, slurry pipelines, and other equipment that can be used in complex haulage systems.

Surface mining results in land disturbance at the excavation site and at processing and waste disposal facilities. Land is also disturbed by roads connecting all these facilities, by refuse piles, by "tailings" or slurry ponds, and by spoil dumped in completed mine openings or valleys and hollows. These areas may be more or less separate, or they may adjoin and make up a single disturbed area. The disposal of excess spoil from coal mining is a special problem within the broader context of land disturbance and refuse disposal.

During the past centuries of coal mining, refuse was disposed of haphazardly and different types of refuse were often intermingled indiscriminately. Hazards to human safety and health and degradation of the environment were slow in being recognized as warranting governmental attention. For many decades the waste slurry from coal-washing plants was discharged into waterways, but after World War II concern for cleanliness of water and the preservation of stream life led to the building of settling ponds behind banks of coarse waste (Kaufman and Williams 1978). It was not until after the Buffalo Creek disaster in 1972 (see Working Paper I) that the design and construction of impoundment dams were regulated (Kaufman and Williams 1978). Burning coal refuse piles in some coal fields were fairly common, but it was not until 1962 that any attempt was made to control this burning by issuing regulations under the federal Air Pollution Control Act of 1960. The catastrophic failure of a pile of mixed refuse at Aberfan, Wales (see Working Paper I) in 1966 showed that refuse piles that do not impound water still require proper design and construction to ensure stability.

The overburden covering a mineral deposit has been handled in the past in a variety of ways. At first, this waste rock, or spoil, was commonly dumped in worked-out mine cuts or left in piles or banks around the mined-out area. But as early as 1850 in England the overburden from iron ore mining was spread over the area and seeded (Down and Stocks 1977). Some coal strip areas in Pennsylvania, Indiana, and Ohio were backfilled and returned to farming and tree culture at least as early as the 1920s. In hilly areas and especially along coal seams cropping out on steep slopes, past practice was to cast overburden down the outslope. This practice led to difficulty in reclamation and revegetation, to stream pollution, and, in some instances, to hazardous conditions such as landsliding (see Chapter 7). This practice is no longer permitted, however, and so it has been necessary for coal mine operators to develop alternative methods of disposal of excess spoil.

In northern and western Appalachia, storage of overburden was accommodated by backfilling and regrading the mined areas to the approximate original contour or by other reclamation techniques. However, steep slopes in central Appalachia made these solutions difficult and in some cases impossible (DOI 1978). The environmental constraints on contour mining and outslope spoil dumping, combined with the large amount of unrecoverable coal left behind, led to the development of the mountaintop removal method of mining, whereby all of the overburden is removed to expose and extract the entire coal bed located near the top of the mountain or ridge. The large amounts of excess spoil generated are deposited as fills in valleys or in heads-of-hollows (see Figure 2.1). This method, first employed in 1967 in West Virginia (EPA 1979), results in a relatively level area. The fills constructed of the excess spoil removed from the mountaintop provide additional level areas instead of the highly erodible and unstable sinuous bands of spoil on the outslopes as in previous practices (EPA 1979). These level areas provide land suitable for new land uses (DOI 1978). Traditional contour mining can also use the head-of-hollow-fill or the valley-fill disposal method for excess spoil.

The techniques of mountaintop removal and head-of-hollow-fill and valley-fill disposal have been adopted in southern West Virginia, eastern Kentucky, southwest Virginia, and northeast Tennessee, where steep topography predominates. These states adopted regulations containing specific fill construction criteria governing excess spoil disposal.

The increase in surface mining and the great number of small operations brought to public and governmental attention the social and environmental costs borne by the community-at-large of uncontrolled exploitation and the failure to consider postmining land use. Table 3.1 shows that surface mining of coal became significant beginning in the 1940s.

Small operations have been a common feature of coal mining since the beginning of the industry. Tryon and Mann (1926) report that in 1922 the number of mines producing less than 10,000 tons per year was 6114, which constituted 52.2 percent of the total number of coal mines in the country, and they produced 2.6 percent of the total coal. Small operations were encouraged by state laws in Pennsylvania, Ohio, Kentucky, and West Virginia that required railroads to make coal cars available to small miners operating along the rights-of-way (Tryon and Mann 1926). During the Depression, small operations grew in number. Shore et al. (1941) reported more than 2800 such operations in the Pennsylvania anthracite fields that were mining coal illegally. No figures are available on such mining of bituminous coal and lignite.

By 1970, small operations had become less numerous. Bituminous and lignite mines producing less than 10,000 tons/year numbered 1902 (34 percent out of a total of 5601 mines) and produced 9 million tons (1.5 percent of a total of 602 million tons).

Small operations generally used outmoded mining techniques, and there seemed to be not much regard for human safety, environmental damage, property rights, or postmining land use. Mine workings were commonly abandoned as soon as operations became difficult or dangerous.

Since 1960, several federal acts have been passed to control the undesirable social and environmental effects of coal mining and refuse disposal. Under the Air Pollution Control Act of 1960 the construction and composition of refuse piles have been regulated to control burning. The Water Pollution Control acts regulate the discharge of toxic materials and sediment, which pollute streams and water

TABLE 3.1 Percentage of Coal Produced by Strip Mining in the United States

Year	Total coal produced (thousands of tons)	Percent of coal produced by strip mining
1807-1820	15	
1830	320	
1840	2,070	
1850	7,018	
1860	14,610	
1870	33,036	
1880	71,482	
1890	157,771	
1900	269,684	
1910	501,596	(0.6 in 1915)*
1920	658,265	1.5
1930	529,477	4.2
1940	512,257	7.2
1950	556,387	23.6
1960	434,329	29.9
1970	612,661	40.5
1979	775,800	61.0

SOURCES: Mineral Resources of the United States (for the period up to 1930).
Minerals Yearbook (for the period 1930 to 1970).
Energy Information Administration, Annual Report to Congress (for 1979).

*According to Tryon and Mann (1926) the U.S. Geological Survey began keeping records of coal stripping in 1915 when it accounted for 0.6 percent of total production.

supplies. The 1972 amendments to the federal Water Pollution Control Act established goals for the elimination of pollution from point sources. The Federal Coal Mine Health and Safety Act of 1969 provides control over waste disposal as it affects miners at the mine site, but it was not designed to prevent off-site damages such as those that took place following the failure of the impoundments on Buffalo Creek in 1972 (see Working Paper I). The National Dam Safety Act of 1972 resulted in an inventory and examination of all dams in the United States by the U.S. Corps of Engineers and the recommendation of a national program of inspection and regulation of all dams. The Mine Enforcement and Safety Administration of the Bureau of Mines (now the Mine Safety and Health Administration of the Department of Labor) became responsible for waste impoundments and slurry ponds at coal mines.

After the 1972 refuse impoundment failure on Buffalo Creek, many state regulations were revised to provide stricter controls on disposal practices and the construction of waste banks and impoundments.

Since 1977, drainage from waste piles and slurry ponds has been subject to EPA guidelines and standards established for the coal industry.

OSM regulations under the Surface Mining Control and Reclamation Act (SMCRA) of 1977 cover reclamation as well as pollution abatement and the safety of waste structures resulting from coal mining and processing, including the excess spoil that must be disposed of outside the mine workings.

3.2 HISTORY AND LEGISLATIVE INTENT OF SURFACE MINING LEGISLATION

SMCRA (PL 95-87, 30 USC, §1201 Note) was the first federal law passed to control the undesirable effects of surface coal mining. It emerged from a lengthy legislative process involving many unsuccessful attempts at enacting such legislation, and extensive lobbying from many sides. The enacted legislation is directed at controlling and alleviating the adverse effects of surface mining of coal, although some earlier proposed legislation covered all mineral commodities.

The primary thrust of SMCRA is to "internalize" the costs of coal mining that had formerly been borne by those who suffered its adverse effects. Internalization means that coal operators and coal consumers pay the full costs of returning the land to beneficial use, protecting public health and safety, and preserving resources and protecting the environment instead of passing such costs along to those affected by the mining operations. Precedents for congressional action like SMCRA can be found in the 1911 legislation to regulate forestry and the 1935 legislation to control soil erosion. Eichbaum and Buente (1980, p. 241) point out that "SMCRA's land-capability protection requirements are a product of this evolution. They manifest a federal concern that has been part of our history for over seventy years. And, as the legislative history demonstrates, SMCRA was a conscious continuation of that tradition."

Many of the Act's environmental protection standards were aimed largely at correcting the worst conditions observed in certain of the coal regions. During the formative decade, a variety of legislative proposals that originated from more or less different conceptions of the best means to a solution were considered. Portions of different ones were incorporated in the final legislation, without being wholly reconciled in the framing of SMCRA (see Section 3.2, which follows). The development of the excess spoil provisions in relation to the Act as a whole, especially in view of the fact that these provisions were added late in its history, is discussed in Section 3.2.2. A more detailed discussion of the legislative history is included in Working Paper II.

In reading the legislative history that follows, it is important for the reader to be aware that some of the language of the congressional reports did not remain current with changes in the developing legislation. The resulting inconsistency made it difficult for the regulatory authority to obtain proper guidance on the nature of the regulations it should adopt.

3.2.1 Surface Mining Legislation

The first bill designed to control the strip mining of coal was introduced in Congress in 1940, when surface-mined coal represented about 7 percent of total coal production. This bill would have required restoration of the land to "approximately the same" contour that existed before mining and the posting of performance bonds. The next proposal, introduced in 1949, called for cooperation between the federal and the state governments in forming and carrying out restoration programs; it would have required the Secretary of Agriculture to conduct studies and surveys and to recommend systems of restoration to the states.

Between 1959 and 1965 there were several federal legislative efforts to authorize a comprehensive study by the Secretary of the Interior on the effects of surface mining. That study began in 1965, and the report was issued in July 1967 as Surface Mining and Our Environment (DOI 1967). It signaled the beginning of serious congressional consideration of surface mining legislation and served as the substantive basis for the legislation enacted a decade later. The significance of the Department of the Interior (DOI) report is in the technical perceptions that it fostered, the identification of specific deleterious effects of surface mining, and the concepts bearing on the possibilities of controlling those effects. Observations about water pollution caused by unreclaimed spoil banks and the failure to control surface runoff, especially from haul roads and spoil banks, led to recommendations for drainage control through diversion ditches and the reclamation of mined sites through grading and revegetation. The sliding of spoil banks was singled out as a hazard to life as well as property. Stabilization of spoil banks on slopes in excess of 20 degrees was perceived as "difficult." Remaining highwalls were found to cut off human and wildlife access to certain areas and to reduce the aesthetic value of the landscape.

The series of legislative proposals that followed helped to form additional perceptions that shaped the final legislation. Field trips to West Virginia and Pennsylvania by key legislators resulted in the finding that state regulation was inadequate (N. Williams, OSM, personal communication, 1980). The predominant view became that the federal government would have to set detailed standards in order to accomplish the desired results. The 93rd Congress (1973-1974) attempted to enact strict and detailed standards to ensure carrying out its legislative goals concerning surface mining regulation (N. Williams, personal communication, 1980). While state initiative and flexibility based on regional diversity were not deleted from the Act, Congress moved in the direction of more stringent and uniform federal control. The details of the standards to become part of SMCRA remained to be worked out (N. Williams, personal communication, 1980).

A 1973 report entitled Coal Surface Mining and Reclamation, An Environmental and Economic Assessment of Alternatives (CEQ 1973) focused in large part on the economic impact of an outright prohibition of steep-slope mining (15-20 degrees or more). It concluded that nearly all of central Appalachia would be significantly affected by such a law. The study also discussed methods of steep-slope mining and demonstrated that the modified block-cut method permitted most of the spoil to be kept on the mining bench except for that resulting from the initial cut. Use of head-of-hollow fills was seen as an acceptable method for disposal of excess spoil. Reportedly, field trips by key members of Congress to Pennsylvania confirmed the belief that steep-slope mining could be carried out in an environmentally sound manner. Legislation proposed during the 93rd Congress included stringent provisions in permitting mountaintop removal, along with a requirement that an irreversible commitment to a commercial postmining land use be demonstrated beforehand. It was anticipated that these provisions would minimize the use of mountaintop removal methods and that the problems associated with the permanent storage of excess spoil resulting from mountaintop removal would require minimal legislative attention (D.A. Crane, OSM, personal communication, 1980). The primary concerns of the environmental standards in this legislation were human safety and environmental quality, which largely overrode economic considerations (N. Williams, personal communication, 1980). The absolute nature of the minimum standards was clearly demonstrated by the initial requirement that no operations would be permitted unless reclamation could be achieved according to the standards of the Act (U.S. Congress, Senate 1973).

The first provision dealing with excess spoil appears in connection with the steep-slope mining provisions of the Act. Permanent storage of excess spoil is permitted in designated areas designed by a registered engineer in conformance with "professional standards established to assure the stability, drainage, and configuration necessary for the intended use of the site" (U.S. Congress, House 1974). This language reflected the view that excess spoil would be used to shape the land for appropriate postmining land uses following mountaintop removal. However, the use of the mountaintop removal mining method on a massive scale was not contemplated.

In the 94th Congress, discussions of standards placed more emphasis on the importance of environmental goals in relation to economic considerations. Use of the best available technology to implement environmental standards "requires the adjustment of operation to the environmental protection standards rather than the opposite"; thus the view that "standards should be adjusted to what individual mine operators state they can or cannot afford" (U.S. Congress, House, 1975, p. 105) is rejected. In another House report (U.S. Congress, House 1976, p. 38), the following view on the rationale for detailed standards was expressed:

> The bill is built upon the committee's finding that in the vast majority of cases certain reclamation goals must be achieved if the term "reclamation" is to have any real meaning. Nevertheless, the committee has approved exceptions to these requirements to achieve flexibility and avoid arbitrary constraints. For example, the elimination of high walls, return of the land to approximate original contour, and establishment of viable vegetative cover are among the standards critical to the elimination of the worst effects of coal surface mining and yet these standards are either subject to exception, framed in variable terms, or both. Rather than weakening the effectiveness of these standards, such treatment is viewed by the committee as justified and desirable. Workable Federal requirements must be appropriate to the mining setting and such standards should not preclude practices which are beneficial from a planning viewpoint.
>
> Another element of flexibility is the avoidance of excessive detail in the requirement of the Federal performance standards. The committee is aware, however, of the history of the development of State laws on the subject of regulation of coal surface mining. This history presents a pattern of increasingly detailed legislation and such detail is often traceable to regulations which have failed to provide full implementation of the more general performance standards of the legislation itself. The committee believes that it has struck a balance between legislation which merely frames performance standards in terms of general objectives and standards which are cast in terms more detailed than those generally found in regulatory legislation. In choosing a middle path, the committee is mindful of the past failures on the State level and thus bases its approval of H.R. 2 on the expectation that Federal regulations promulgated under the Act will fully implement the environmental performance standards. Obviously, the mere reproduction of the statutory environmental performance standards in the regulations would be inadequate.

These paragraphs are repeated in the House report on H.R. 2, the House of Representatives version of the bill that was enacted in the 95th Congress (U.S. Congress, House, 1977, p. 84).

3.2.2 Excess Spoil Disposal

The problem of disposal of excess spoil actually came into focus quite late in the legislative process, after mountaintop removal was incorporated in the developing legislation as an acceptable mining technique that could result in worthwhile postmining land uses, although the first provisions appeared in the 93rd Congress. During the 95th Congress the House made the first attempt to create a new subsection dealing exclusively with the disposal of excess spoil in steep-slope mining. The manner of disposal of excess spoil was specified with the exception that placement of spoil on the downslope was permitted when required for the initial block cut. Thus spoil generally could not be placed on the downslope. However, spoil in excess of that needed for reconstruction of the approximate original contour or spoil resulting from mountaintop removal could be permanently stored.

The question of the permanent disposal of excess spoil did not really arise until January 1977, when mountaintop removal was incorporated as an acceptable mining technique whenever any economic postmining land use, as opposed to the physical development of a building or other structure, could be demonstrated (D.A. Crane, personal communication, 1980). Congress included agricultural use as an acceptable postmining land use, conspicuously dropping the word "development" in favor of "use." This amendment opened the door for widespread mountaintop removal, because showing a commitment to agricultural use eluded the restrictive demonstrations required for other postmining land developments (D.A. Crane and N. Williams, personal communication, 1980). It was only then that the need for a provision dealing with permanent disposal of excess spoil became pressing, and language was inserted to ensure that the permanent disposal of excess spoil was engineered to avoid uncontrolled dumping. An interim draft EPA report (EPA 1977) is cited as the basis for conclusions concerning appropriate standards to ensure the stability of excess spoil structures in mountain valleys or hollows (U.S. Congress, House, 1977). Distinct directions based on the EPA report are given in the House report. Design criteria are clearly indicated that show great concern for stability and human safety (U.S. Congress, House, 1977, p. 101):

> Given the size and the complexity of the engineering involved for the disposal areas, specific standards such as the following should be considered:
>
> Carefully place durable rock drains through the complete length of the proposed fill area. Shales should be avoided in the construction of such drains because of the danger of weathering of the shales leading to blockage of the drain.
>
> Drains must be placed running from all seeps or springs in the fill area to the toe of the fill.
>
> Sediment ponds should be placed below the toe of each fill to catch all drainage.

> Excess spoil material should be placed and compacted in lifts or stair step-like benches insuring that particle alignment will tend to be perpendicular to the typical failure plane. End or side dumping off the upper benches should not be used either to create the bench drain or to handle excess spoil after the drain is constructed.
>
> Lifts should be contoured so that all drainage flows off the fill to rip-rapped drainage ways constructed in undisturbed material on either side of the fill.
>
> Rock cores from the drainage system should not protrude above the fill mass because they may contribute to erosion of the fill face if the surface of the core becomes silted at the bench-core interface. This malfunction of the water diversion system could cause water to pond on the bench, then flow down the fill face.
>
> Woody vegetation removed from the mine or hollow fill area should not be placed in the fill mass because it would endanger the stability of the fill.
>
> It should be noted that although the committee amendment groups coal waste disposal and excess spoil placement in the same subsection these disposal processes should be substantially separate due to different particle and moisture characteristics of the mine wastes.
>
> In addition to the above guidelines for spoil area disposal construction, consideration should be given to requiring more extensive monitoring and inspections of such operations, particularly during the period of drain construction. Where such fills will exceed 1 million cubic yards in volume, additional precautions for inspection are a necessity.
>
> With careful engineering and particular care taken in the construction of such fills, it should be possible to provide safe, stable spoil storage areas which may have improved land uses.

Congress incorporated these detailed provisions regarding excess spoil disposal practice into the Act itself, even though they were based on an incomplete study. In attempting to follow the directions of the House report to the effect that implementation of the Act would require OSM to do more than merely repeat the statutory provisions, OSM compounded the rigidity of the standards in the law. The result was unfortunate because subsequently the Skelly and Loy report to EPA (1979) indicated that there were other technically acceptable and less rigid spoil disposal practices (see Sections 3.2.1 and 3.3).

On the whole, the legislative history of §515 provides little assistance to the regulatory authority in establishing its regulatory program. The dilemma of the regulatory authority in trying to glean some guidance from the legislative history is heightened by the fact that the official congressional committee reports, in commenting on §515, sometimes did not stay current with changes in the language of the legislation as it was considered by Congress. Thus the last House report recommends specific criteria to the regulatory authority in implementing §515. At the same time, Congress placed many of those recommended standards in the final bill, and for this reason congressional direction to the regulatory authority concerning the extent to which additional design standards and criteria are to be employed in implementing §515 is clouded. Congressional guidance is further obscured by the sometimes unclear relationship between the commentary in committee reports and the actual language of the bills as they underwent congressional consideration. Here again, the reports did not always remain current with changes in the legislation.

The legislative history of §515(b)(22) thus gives little guidance to the regulatory authority on the regulatory approach it should adopt. What is clear, above all, is the congressional directive that sound reclamation be achieved and Congress's hope that it gave enough authority and guidance to the Secretary of the Interior to accomplish that end by using whatever regulatory approach he deemed most advisable.

3.3 DEVELOPMENT OF THE REGULATIONS

3.3.1 Introduction

The "regulatory scheme" of SMCRA, that is, the assignments of authority, the choice of processes, and the designation of standards, evolved as different proposals were considered, modified, and incorporated into various drafts of the legislation. Prior to the 92nd Congress (1971-1972), legislation introduced to control surface mining and reclamation was somewhat vague in outlining authorities, processes, and standards.

The legislative history indicates that framers of SMCRA saw surface mining as a temporary use of land that left it in a seriously degraded condition unless adequate reclamation was provided. Disturbances resulting from surface mining were seen as a problem of national scope requiring a federal solution in the form of a detailed regulatory program to ensure that serious and permanent environmental damage and diminished land-use capabilities were minimized.

3.3.2 Actions of the Department of the Interior

In the spring of 1977, DOI established an interagency task force to prepare for implementation of SMCRA in anticipation of passage of the Act. The task force supervised the work of drawing up regulations based on the expected provisions of the Act. During the summer of 1977 a number of working committees were formed. A committee made up of specialists from the U.S. Geological Survey, Bureau of Mines, Environmental Protection Agency, Bureau of Land Management, Forest Service, Fish and Wildlife Service, and Soil Conservation Service prepared the first draft of interim regulations to implement §515 of the Act, including most of the provisions controlling the disposal of excess spoil.

The interim program regulations were issued on December 13, 1977, four months after the Office of Surface Mining (OSM) was created by the signing of the Act by the President on August 3, 1977. However, it was not until March 1978, when the entire 1978 supplemental budget was enacted, that OSM received any funding. From August 1977 to March 1978, OSM existed by statute, but it had no budget and hence no employees. The task force continued its efforts to prepare for an Office of Surface Mining, hire personnel, and write regulations. Section 501(b) of the Act required promulgation of the permanent regulations by August 3, 1978. In April 1978 a small technical staff began to draft permanent regulations under the direction of top agency officials. Drafts of these proposed regulations were released on July 3 and 21, 1978. After informal hearings, meetings, and comments, the drafts were refined by OSM staff and published on September 8, 1978, as proposed permanent regulations (see 43 Fed. Reg. 41662 et seq.). The formal rule making is described in the preamble to the final regulations (see 44 Fed. Reg. 14907-14910, March 13, 1979).

The permanent regulations had to be accompanied by an environmental impact statement as required by the National Environmental Policy Act and a regulatory analysis as required by Executive Order 12044. Much of the work had to be done by specialists, borrowed from other federal agencies, under the leadership of OSM employees and top agency officials. The work was done under the pressure of a statutory deadline that had already passed.

In November 1978 the comments of the Regulatory Analysis Review Group of the Council on Wage and Price Stability) were submitted to the Council of Economic Advisers and incorporated in the Council's report (Council on Wage and Price Stability 1978). Briefly, the report found that OSM's regulations appeared to be more stringent than required by SMCRA and more stringent even than those of EPA; that OSM had not analyzed the consequences of important parts of its regulations; and that the regulations could be rewritten to allow substantial savings in cost without increasing risk to the environment.

In February 1979 the final environmental impact statement and the final regulations were released. The regulations were published in the Federal Register on March 13, 1979.

3.3.3 Perceptions That Influenced the Regulatory Approach

Much of the discussion that follows is based on opinions, recollections, and judgments of various officers of the Department of the Interior and OSM involved in shaping OSM's regulatory program. Some OSM officials were interviewed, but not all (see Acknowledgments). The material here is interwoven with the ideas and judgments of CODES members. An effort has been made to present differing views if they were significant in the policy debates over OSM's regulatory approach.

The legislative history of SMCRA, and DOI and OSM perceptions of their mandate under SMCRA, provided initial guidance for the regulatory approach adopted (see Section 3.2). OSM interpreted the Act as giving public safety and health and environmental protection priority over other considerations. For example, OSM accepted the view that the provisions of the Act would preclude mining in some areas for technical reasons (such as steepness of slope) or for economic reasons (the additional cost inherent in complying with new requirements). Both the U.S. District Court and the Court of Appeals concluded, in support of OSM, that the Act did not permit a variance for reasons of economy or technical feasibility (In Re: Surface Mining Regulation Litigation, 452 F. Supp. 327, 338 (D.D.C. 1978); and In Re: Surface Mining Litigation, F.2d 627, 1345, 1356 (D.C. Cir. 1980)). In addition, §522 of the Act specifically designated certain areas as unsuitable for surface mining.

Section 502(a), (b), and (c) of the Act deals with the issuance of mining permits under state rules and the standards that were to be applicable. Both the Act itself and House Report 95-218 indicate that Congress intended the states, through permitting, inspection, and enforcement, to implement the interim standards, with OSM review, inspection, and enforcement serving only to back up the state programs. The changes in state operations assumed by the federal Act required amendment of state laws, adoption of new regulations, and program adjustments that took more time than Congress had allowed for. Moreover, under recent interpretations of the Constitution, the federal government had no authority to require any state to change its laws or regulations or otherwise participate in the joint venture that Congress had envisioned for the interim period (see National League of Cities v. Usery, 426 U.S. 833 (1976)). The Act also provides for federal implementation whenever any state declined the option of a state program, and Georgia and Washington decided not to have their own programs.

Permitting, inspection, and enforcement operations by state agencies and OSM during the interim period could not bring about the complete implementation of the Act's environmental standards because of a variety of legal, budgetary, and staffing difficulties. The failure to meet the statutory mandate on enforcement was the subject of a lawsuit by a number of environmental groups (see Council of Southern Mountains v. Andrus, unreported opinion for Civil Action No. 79-1521 District Court for the District of Columbia, filed in 1979).

Some seventeen coal-producing states made changes to implement the interim program, but OSM's detailed regulations and aggressive enforcement actions during the interim period were a source of disagreement between OSM and the coal industry. The agency relied on language in a congressional committee report (U.S. Congress, House 1975) that said that the §515 performance standards were meant to "require the adjustment of operation to the environmental protection standards rather than the opposite." The committee report cited the inadequacies of state laws as clear evidence of the need for regulations more detailed than the provisions of the Act (U.S. Congress, House 1976, 1977). OSM understood that implementation of the Act would require in the regulations a specific detailing of activities permitted under the general provisions of the Act (U.S. Congress, House 1976, 1977, pp. 3-25). Although state requirements were becoming increasingly detailed as it became apparent that state standards were, in many cases, inadequate to achieve the protection desired, OSM concurred with the perception of Congress that the states were unprepared to enforce an acceptable program. Detailed regulations promulgated by the federal government would require the states to enforce a program that would compensate for possible deficiencies in state standards and their implementation.

Faced with the lack of history of acceptable coal mining and reclamation and waste disposal practices, OSM tended to adopt engineering concepts leading to overdesign, which were assumed to eliminate the risk of failure. This conservative approach, emphasizing design standards, was considered the most expedient way to enforce compliance with the regulations. The use of explicit design standards and criteria in the regulations was viewed by OSM as facilitating federal and state enforcement and minimizing conflict with coal operators by setting forth exactly what was expected.

Several factors influenced the adoption of this approach. The analysis by CODES of the legislative history indicates that the short time frame for preparing the interim regulations and the brief duration of the interim program resulted in OSM's adoption of design standards because they would provide the most direct approach in ensuring compliance. OSM was apparently unsure that its relatively inexperienced enforcement staff would exercise the appropriate degree of discretion in enforcing performance standards. A further consideration was the fact that OSM had too few inspectors to make repeated examinations of each facility, as would be necessary under the use of performance standards, and legal relationships with state regulatory agencies were confused because of concern about the provisions of §502, as was discussed above. The review by CODES of the development of the regulations showed that there was also a concern that a substantial number of mine operators would not have the experienced personnel to pursue a performance-standard approach and that industry efforts to reduce costs and increase profits worked against the primary concern for human health and safety and environmental quality to which SMCRA was dedicated. Design criteria were also considered desirable in cases in which the states and OSM did not have at hand the necessary professional staff to meet the demands of SMCRA. OSM apparently believed that it had too few experienced personnel, especially in ground-water hydrology and mining engineering. Staffing problems in OSM and state agencies were exacerbated by disparities in salary levels between federal and state government and industry.

OSM's rationale for using a design-standard approach in preparing its interim regulations is illustrated by the provisions covering valley and head-of-hollow fills. Requiring the placement of spoil in lifts (layers of material) less than 4 ft in thickness to ensure stability would make monitoring by OSM easier and compliance simpler for mining personnel. Because spoil structures would not be maintained or monitored after a mine closed, it was considered that their long-term stability could be most effectively assured by requiring adherence to rigid design standards. It was considered essential that waste disposal structures be constructed properly by the mine operator at the outset to avoid imposing on the community the hazard or burden of the difficult and costly task of redesigning and rebuilding the structure if signs of structural defects were found after the operation was completed. Achieving structural stability for disposal piles through design criteria was seen as offering the best assurance of meeting the environmental protection goals of SMCRA.

The statutory provisions dealing with the disposal of excess spoil were based on an interim report to EPA on an environmental assessment of surface mining methods (EPA 1977; see also Section 3.2.2). However, the authors of that report disagreed with OSM when the report was cited as supporting the interim regulations (Skelly and Loy Engineers-Consultants, written communication, December 1978). They noted that there was no allowance for site-specific design; lift thickness should be 4 ft instead of 18 in.; side-dumping should be permitted in certain cases; a safety factor of 1.1 or 1.3, instead of 1.5, is appropriate; and drainage control should be based on a 10-year storm (the greatest amount of rain that can be expected to fall once every 10 years) but not of 24-hour duration.

Provisions in the regulations for approval of alternate spoil disposal designs as exceptions to the regulations were not adequately implemented. Such delays and difficulties were said by some of the people interviewed (see Acknowledgments) to be the result of the staff's being diverted to other tasks (such as determining lands unsuitable for mining and analysis of state programs). Once these tasks were completed, OSM personnel could be expected to be able to review fill designs proposed as exceptions to the regulations by operators promptly.

Others interviewed estimated that 95 percent of operator-designed fills would fit within the concepts of the regulations and that the professional engineer would remain in control of important judgments. The opposite view, i.e., that a large part of the engineer's judgment had been preempted by the regulations, was also expressed.

Additional comments made by some of the people interviewed indicated that OSM believed that the provisions of the Act and the regulations allow for experimentation with new techniques and provide ample flexibility for developing new methods of excess spoil disposal, e.g., the durable rock provisions added to the permanent regulations, but such provisions should be used judiciously to avoid misuse or overuse. The monitoring provisions of the Act were also viewed as less stringent than those imposed on highway and dam construction.

Some technical areas where need for further study was seen were suggested during the interviews. These included the allowable dimensions of the material to use in underdrains; the allowable dimensions of the fill material; the magnitude of the storm event that should determine the carrying capacity of a diversion structure; the advantages and disadvantages of combining, under specified conditions, excess spoil with coal waste in disposal structures; alternatives to EPA water standards in designing sedimentation ponds; alternatives to restoring prime farmland; alternatives to restoring the surface to the approximate original contour; using different types of liability bonding as incentives and disincentives to compliance with the regulations; circumstances under which manuals or guidebooks would be useful to both operators and inspectors, e.g., manuals geared to regional characteristics; and the practicality and desirability of assisting small operators in subject areas other than hydrology, e.g., in design and construction of fills, impoundments, roads, and diversion structures.

Statements by the administration and citizen (environmental) groups defending OSM succinctly summarize the philosophy guiding OSM's development of SMCRA regulations. For example (note that in the following quotation the term "performance" is misused and the term "design" should be substituted) (Galloway and McAteer 1980, p. 305):

> First, past and present abuses make detailed performance standards necessary to achieve the environmental goals of the Act. Second, specific performance standards facilitate rational planning to meet the requirements of the law. Third, vague performance standards require numerous subjective judgments, and would lead to disuniformty and endless litigation over what constitutes achievement of the broad environmental goals of the Act. Fourth, detailed performance standards are far easier to enforce. Finally, the Administration argues that variance procedures are built into the regulations where they are necessary to afford adequate flexibility for site specific conditions.

Although the regulations provide flexibility, they do so by granting exceptions to specific requirements rather than by establishing requirements on a site-by-site basis (U.S. Regulatory Council 1981).

In the permanent regulations the degree of specificity and detail in the standards decreased only slightly from that promulgated under the interim regulations. For example, the process of issuing permits and the inspection and enforcement processes are completely unified under an approved state program or, in the absence of an approved state program, an OSM program. Continuing emphasis on the high degree of specificity was due in part to distrust of the states in the exercise of broad discretion and in part to the convenience of having on hand regulations that could be utilized with only minor adjustments.

OSM did not consider the prior history of state regulation, either pre-SMCRA or during the interim period, to be a significant consideration in the process of approving plans and monitoring mining operations under a program submitted by a state in accordance with the provisions allowing state primacy. OSM could either rely on its dual enforcement role in the permanent program to ensure that a state fully implemented SMCRA, or it could impose detailed standards and procedural requirements for state adoption. If OSM could not induce the desired action by a state, third parties could force action under the citizen suit provisions of SMCRA.

The independent enforcement effort by citizens through the citizens' suit provisions is recognized in SMCRA itself and in the legislative history. Section 520 contains one of the most complete citizen suit provisions in federal law. Section 521 provides for mandatory federal inspections upon receiving citizens' complaints about a violation of the Act, the regulations, or a permit, and provides citizens with the right to accompany federal inspectors to mine sites during inspection. Section 525 provides for administrative review of Secretarial action or inaction by "any person having an interest which is or may be adversely affected." The permitting requirements in §506-514 contain citizen involvement rights unlike any other federal law of a similar nature. Moreover, §522 creates a unique process for citizen involvement in the decision to allow or prohibit mining at a given site.

Not all the permanent regulations were acceptable to the coal industry or the states. The "Rockefeller Amendment" to SMCRA, passed by the Senate in September 1979 but later blocked in the House, would have changed §503(a)(7) and removed the requirement that states adopt "rules and regulations consistent with regulations issued by the Secretary pursuant to the Act." The criteria for approval of a state program would have focused on consistency between the state law and SMCRA.

OSM attempted to soften the impact of its detailed approach through adoption of a "state window" provision (30 CFR §731.13), which permits a state to adopt alternative regulatory provisions. However, the use of the state window provision has been largely illusory because approval of the state regulatory alternative is contingent on the state's demonstrating that the proposed alternative will be consistent with OSM's regulations as well as with SMCRA. These provisions may not provide the flexibility envisioned by Congress in the creation of state regulatory programs geared to local conditions, as stated in §101(f) of the Act.

During the debate on the Rockefeller Amendment and the utility of the state window provision, several states began negotiating with OSM about their program submissions to gain state "primacy" (primary regulation authority). As negotiations proceeded, OSM perceived the need to find practical solutions to the states' problems, and therefore the state window became less important. In the end, few states availed themselves of the window as a basis for alternative language in their regulations. OSM believed that it would be appropriate to accept different state regulatory language as long as OSM and the state interpreted the language as being consistent with SMCRA and the federal regulations; however, OSM's interpretations were generally paramount. Most states achieved primacy in the closing months of the Carter Administration.

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Chapter 4

EVALUATION OF STATUTORY REQUIREMENTS AND REGULATIONS, THEIR ENVIRONMENTAL CONSEQUENCES, AND ASSOCIATED COSTS

4.1 INTRODUCTION

In this chapter the regulations governing excess spoil disposal are reviewed and evaluated. In addition, relevant Office of Surface Mining (OSM) regulations concerning hydrologic balance are considered, because they are an integral part of the required control measures for excess spoil structures. The environmental consequences of the regulations are studied to determine whether they have benefited the environment, and an assessment is made of the costs involved in complying with the regulations. Finally, OSM regulatory requirements and requirements under some state laws in effect prior to passage of SMCRA are briefly compared.

4.2 EVALUATION OF THE REGULATIONS FOR DISPOSAL OF EXCESS SPOIL

The general requirements for excess spoil disposal associated with mining in flat terrain are contained in §515(b)(3) of the Act; however, the significant engineering and environmental constraints in constructing excess spoil structures relate to mining in mountainous terrain and these are dealt with in §515(b)(22) of the Act and four sections of the permanent regulatory program: §816.71, disposal of excess spoil, general requirements; §816.72, disposal of excess spoil, valley fills; §816.73, disposal of excess spoil, head-of-hollow fills; and §816.74, disposal of excess spoil, durable rock fills. Other parts of the regulations are referenced within those sections, particularly those pertaining to environmental concerns and the stability of the fill material.

The main section of the Act that pertains to excess spoil disposal is as follows:

> §515(b)(22) Place all excess spoil material resulting from coal surface mining and reclamation activities in such a manner that--
>
> (A) Spoil is transported and placed in a controlled manner in position for concurrent compaction and in such

> a way to assure mass stability and to prevent mass movement;
>
> (B) The areas of disposal are within the bonded permit areas and all organic matter shall be removed immediately prior to spoil placement;
>
> (C) Appropriate surface and internal drainage systems and diversion ditches are used so as to prevent spoil erosion and movement;
>
> (D) The disposal area does not contain springs, natural water courses or wet weather seeps unless lateral drains are constructed from the wet areas to the main underdrains in such a manner that filtration of the water into the spoil pile will be prevented;
>
> (E) If placed on a slope, the spoil is placed upon the most moderate slope among those upon which, in the judgment of the regulatory authority, the spoil could be placed in compliance with all the requirements of this Act, and shall be placed, where possible, upon, or above, a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement;
>
> (F) Where the toe of the spoil rests on a downslope, a rock toe buttress of sufficient size to prevent mass movement is constructed;
>
> (G) The final configuration is compatible with the natural drainage pattern and surroundings and suitable for intended uses;
>
> (H) Design of the spoil disposal area is certified by a qualified registered professional engineer in conformance with professional standards; and
>
> (I) All other provisions of this Act are met.

The requirements contained in the Act are very specific, and many appear to be workable, although some impose limitations on the use of sound alternative techniques appropriate to some sites and limit the nature and form of the regulations accordingly.

Much of the controversy surrounding the OSM regulatory program focuses on OSM's interpretation, especially in the interim regulations, of some of these provisions and the rationale for developing the regulations. Particularly sensitive are the stipulations for transporting and placing spoil in a controlled manner for concurrent compaction, the clearing of vegetative matter, the placement of the toe of the spoil on or above benches and natural terraces, and drainage--all of which raise the question of the relevance of current and developing technology of spoil disposal to these issues. An equally important consideration is that some of the provisions in the regulations mirror requirements in the Act, and the evaluation made by CODES of these regulations applies to the statute as well. Also of concern are those regulations that appear to go beyond the requirements of the Act. These issues are discussed in the following review of §§816.71-816.74 contained in Part 816--Permanent Program Performance

Standards--Surface Mining Activities of the OSM regulations. This evaluation also applies equally to §§817.71-817.74 contained in Part 817--Permanent Program Performance Standards--Underground Mining Activities of the OSM regulations, as these regulations contain identical requirements for disposal of underground development waste and excess spoil.

4.2.1 Disposal of Excess Spoil: General Requirements

> §816.71(a) Spoil not required to achieve the approximate original contour within the area where overburden has been removed shall be hauled or conveyed to and placed in designated disposal areas within a permit area, if the disposal areas are authorized for such purposes in the approved permit application in accordance with Sections 816.71-816.74. The spoil shall be placed in a controlled manner to ensure--
>
> (1) That leachate and surface runoff from the fill will not degrade surface or ground waters or exceed the effluent limitations of Section 816.42;
> (2) Stability of the fill; and
> (3) That the land mass designated as the disposal area is suitable for reclamation and revegetation compatible with the natural surroundings.

In prohibiting excess spoil disposal outside the permit area, the possibility that spoil material could in some cases be valuable for other uses is not taken into account. Such uses should be permitted and encouraged when the spoil material can be substituted for borrow material, thus avoiding the development of new borrow pits or disturbances of the soil surface in other locations.

Prevention of the degradation of surface and ground waters and lands by leachate and runoff is a performance standard that must be met. As is noted in Chapter 7, the quality of surface runoff could be influenced by the mineral composition of the upper layers of the spoil bank, since rapid breakdown of the spoil material due to accelerated weathering might occur. The potential increase in water storage within mined-out areas even after backfilling, in sedimentation ponds, and to a lesser extent in excess spoil banks, can also influence the chemical loading in the stream base flow through infiltration. This is particularly noticeable in periods of low stream flow. Recognition of these factors is important in establishing water quality standards. The objective to strive for is a balanced natural system, which means that water leaving a mining operation should be as similar as possible to the water in the watershed even during active mining. A natural background standard for water is one that maintains existing ecosystems with little or no impact from mining operations (see Chapter 7). For instance, if the natural undisturbed area similar to that being mined would produce runoff during a storm at 500 ppm of total suspended solids, then under the same conditions that level should be allowed from the mine site. However, this approach is inconsistent with EPA's long-standing interpretations of the Clean Water Act. Effluent limitations for point sources are technology based on achieving nondegradation of water quality. SMCRA requires OSM to adopt EPA's approach.

Where the receiving surface water system is badly affected by upstream industrial effluents, including acid mine drainage, stricter effluent standards may be considered appropriate to compensate for the additional pollution in the receiving stream when overall regional conditions are examined. However, one must keep in mind that contributions of agriculture, forestry, forest fires, and landslides occur. It would be inequitable to ask coal mine operators to pay the costs of water treatment above natural background to compensate for water degradation from other causes. Where pollution results from actions outside the mining industry, the costs of cleanup must be borne by those entities. Where the pollution is the result of completed or abandoned mining activities, Title IV of the Act, Abandoned Mine Reclamation, provides a system and funding for correction of these problems at the source. Should this not be totally effective, a case can be made for water treatment plants at strategic locations. These plants would be paid for from the reclamation fee by all operators, as required in §402 of SMCRA.

Reclamation and revegetation of the spoil area compatible with the natural surroundings is a major thrust of the Act and a positive step in ameliorating the impact of mining operations.

> §816.71(b) The fill shall be designed using recognized professional standards certified by a registered professional engineer and approved by the regulatory authority.

This provision is sound. Engineers having appropriate qualifications and experience commonly design complex structures that meet required performance standards in a cost-effective manner. There are occasions when the engineer will need to design for unusual or unexpected situations encountered in the field or during construction, but this need is not recognized by the OSM regulations. In a performance-oriented approach, there are opportunities for flexibility to deal with such conditions.

> §816.71(c) All vegetative and organic materials shall be removed from the disposal area and the topsoil shall be removed, segregated and stored or replaced under Sections 816.21-816.25. If approved by the regulatory authority, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

The removal of all vegetative and organic material from the disposal area is recognized as normal practice. However, it may not be necessary in all cases, even though required by §515(b)(22)(B) of the Act and §816.71(c) of the regulations. The decision will depend on the location and characteristics of the spoil site, the nature of the excess spoil materials, the presence of ground water (springs, seeps, etc.), the foundation conditions, the construction method, the type of vegetation, and the amount, quality, and productivity of the topsoil.

In large fills, structural requirements may dictate removal of vegetation and underlying soil only in those critical areas that affect the stability of the fill. If the stability of the fill is not affected by the presence of topsoil, then the quantity and/or quality of the topsoil may be one of the considerations in whether or not to remove it. Where stability analysis indicates that a stronger bond is required between foundation material and fill material, the vegetation should be removed from the front portion of the fill, as it may be located on a potential failure surface. The engineer can determine the critical areas on a site-specific basis.

In some situations the topsoil is thin and the A and B horizons are not necessarily the best soil material; this is recognized in the Act in §515(b)(5). For example, plant nutrients may have leached out, salts may have accumulated, or a clay pan may have formed. In the West, surface soil horizons often lack the characteristics of a mature soil. In these cases, use of overburden other than topsoil can lead to an improvement in the chemical, physical, or biological characteristics of the root zone and thus be a more productive resource than the original topsoil (NRC 1981). Until recently, materials other than topsoil have not usually been salvaged, but current plans are to use overburden to establish vegetation on waste dumps of processed oil shale (NRC 1979). Also, dredge spoil is seldom covered with topsoil, and yet these spoils support healthy vegetation. Under conditions such as those described here, the removal of topsoil would be an unnecessary operation that might expose the land to more erosion.

Cleaning and grubbing of the entire area of the spoil disposal site prior to construction of the fill would result in a large area being exposed to erosion until the fill is completed. This problem could be avoided by successive clearing and grubbing as construction progresses, which does not appear to present a regulatory conflict.

> §816.71(d) Slope protection shall be provided to minimize surface erosion at the site. Diversion design shall conform with the requirements of Section 816.43. All disturbed areas, including diversion ditches that are not rip-rapped, shall be vegetated upon completion of construction.

Slope protection to minimize soil erosion is an accepted and desirable practice in the construction of fills. If a diversion ditch is to be built prior to or during construction and will remain after completion of the project, it should be riprapped or grassed at the time of its construction so that the protective medium becomes established. Some maintenance work may have to be performed after completion of the fill.

> §816.71(e) The disposal areas shall be located on the most moderately sloping and naturally stable areas available as approved by the regulatory authority. If such placement provides additional stability and prevents mass movement, fill materials suitable for disposal shall be placed upon or above a natural terrace, bench, or berm.

The location of disposal areas on the most moderately sloping and naturally stable areas available is mandated by SMCRA and required by the regulations, but the most moderate slopes may not always offer the most cost-efficient placement of excess spoil. A steeper site may be completely safe, meet all other requirements of the Act, and be much more economical to use when haul distances are considered. The engineer must consider both stability and economics in deciding on the location of excess spoil disposal sites. The requirement of using the most moderate slope should be dictated only where stability analysis shows other sites to be unsafe or incapable of meeting environmental protection requirements of the Act.

The requirement that fill materials be placed on or above a natural terrace, bench, or berm when this would provide additional stability and prevent mass movement should be viewed with caution. A natural terrace, bench, or berm may indicate a geological fault, which is a plane of structural weakness, or it may indicate the location of a previous slide. Although the area may have become stable in the natural state, under the stresses of added overburden its natural stability might decrease or, in the case of a fault, might be subjected to further movement triggered by seismic forces, blasting, or water infiltration.

The regulations need to consider stability and strength in the total structure, including foundation conditions. Before any natural terrace, bench, or berm is used for the toe of any fill, the condition of the natural structure must be determined by a geotechnical engineer or geologist familiar with the area. This is an integral aspect of achieving a structure "in conformance with professional standards."

> §816.71(f) The spoil shall be hauled or conveyed and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and prevent mass movement, covered, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and ensure a long-term static safety factor of 1.5.

One of the most controversial regulations is the requirement that "the spoil be hauled or conveyed and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability. . . ." This requirement implements §515(b)(22)(A) of the

Act. The restrictive interpretation of this section of the Act by OSM that prohibited dumping from the mining bench was apparently based on the legislative history (see Section 3.2.2). While the provisions in §816.71(f) prohibit dumping and allow only haulage (e.g., by truck) to assure mass stability and the prevention of mass movement, they are also designed to ease the problems of enforcement (see Section 3.3.3).

The requirement in the Act and the regulations for "controlled placement and concurrent compaction" was evidently a reaction to past practices, particularly in contour mining, where the excess spoil was simply pushed over the edge of the mine bench in an uncontrolled manner. Yet there are methods of placing spoil other than layering in thin lifts with compaction by mechanical means to achieve mass stability that the Act and the regulations apparently resisted initially, e.g., the concept of controlled dumping of spoil from the mining bench at the end, the side, or the perimeter of the valley as an effective method of spoil placement under some conditions (Fed. Reg. 44(50)). However, §816.74, which was added to the permanent regulations, provides for single-lift dumping under certain conditions approved by OSM (see Section 4.2.4). The same language was also incorporated in the amended interim regulations. Although OSM personnel interviewed during this study indicated that the provisions of §816.74 were to be used cautiously to prevent misuse or overuse, it is the observation of CODES that this method of spoil disposal is being more widely used than when first promulgated.

There are conditions where spoil materials containing 80 percent or more of durable rock can be end-dumped to attain a stable structure and prevent mass movement, as in §816.74. In other cirumstances, mixtures of 50 percent hard rock and 50 percent soft shales, or 25 percent hard rock and 75 percent soft shales, can be used to construct fills to meet stability requirements by end-, side-, or perimeter-dumping. Under these practices a "dam" would be constructed at the toe of the fill by reworking the spoil material there into compacted layers (American Consulting Engineers Council 1978). This operation would be expected to provide the stability necessary to hold the fill material behind it in place.

Engineers experienced in spoil disposal and dam construction contend that compaction of broken rock, often in very large fragments, in thin lifts does not significantly increase the safety factor above that for relatively high lifts. The American Consulting Engineers Council (1978), quoting Sherard et al. (1963), points out that the energy of large rocks sliding down a steep slope is more effective in compacting the embankment to a dense state than conventional mechanical compaction of thin lifts. According to the American Consulting Engineers Council (1978), the compaction resulting from gravity could qualify under the meaning of "concurrent compaction required in the Act."

A more comprehensive discussion of layered and compacted lifts, and of end-dumping as a means of placing spoil, is contained in Vandre (1980, pp. 12-13):

End-dumped embankments present more concern as to long term stability than do layer placed embankments. End-dumped embankments are constructed by dumping material on slopes which assume the angle of repose for the materials, thereby creating embankments of comparatively loose material. Layer placed embankments can be placed and compacted to control material density and strength.

Economics is the primary advantage of end-dump construction compared to layer placement construction. In steep terrain, building layers from the bottom up costs more than end-dumping from the mine level. In certain circumstances, end-dumping can provide characteristics conducive to increased stability. As a result of end-dumping, the materials at the base of the embankment are coarser due to gravity sorting and are consequently more permeable. Layer placement results in a finer less permeable embankment material overall because of mechanical breakdown under the placement and compaction equipment. The segregated permeable material will allow drainage to occur, thereby preventing water pressure at the base of the embankment. Under similar circumstances, a layer placed embankment could result in hydrostatic buildup. Finally, infiltration of surface water will be drained toward the bottom of the embankment in an end-dumped embankment, while it could remain perched in a layer placed embankment.

The following are advantages of layer placement:

(1) Five to 15 percent more material can be located in a given area because of higher compaction and lower void space.

(2) End-dumped slopes are usually at the angle of repose with a factor of safety near 1.0. A layer-placed embankment generally has flatter slopes and higher safety factors.

(3) There is less risk of shear strength deterioration with time.

(4) Better quality control of drainage features can be maintained.

(5) Settlement is more predictable and usually less than in end-dumped embankments.

(6) The potential for collapse settlement can be minimized with adequate compaction.

When evaluating the stability of end-dumped embankments compared to layer placed embankments, the potential decrease in subsurface water problems should be weighed against the decrease in material strength and settlement potential.

The primary stability concern associated with end-dump embankments results from the possibility of

> the occurrence of a loose, collapsible particle structure within the fill. If this occurs, deformation can cause localized areas of arching, thereby reducing normal pressures and shear strength at those locations. Also, increases in moisture content or earthquake shocks may initiate collapse. If the fill is saturated in the vicinity of the slope, massive instability could occur. An additional concern of end-dumped placement is the creation of preferred planes of weakness within the embankment. The dump slope can be covered with snow, ice, weak soils, or other materials which do not have the same strength as the embankment material. This in turn creates preferred failure planes when additional material is placed on the embankment slope. Shallow slope failures are possible along these planes and through the foundation materials.
>
> The maximum shearing stresses occur beneath the slopes of an embankment. A higher strength perimeter zone can provide lateral support for weaker collapsible end-dumped material placed within the central portions of the embankment.

These guidelines present valid considerations for end-dumping and lift placement, pointing to the conclusion that the ultimate decision can best be made on a site-specific basis by a professional engineer qualified in spoil dump design.

Experience in Colorado suggests that a number of pre-SMCRA disposal fills constructed by end-dumping techniques have performed well (J. A. Pendleton, Colorado Department of Natural Resources, Mined Land Reclamation Division, written communication, 1980). In designing the Tennessee-Tombigbee Waterway, the U.S. Army Corps of Engineers planned to put excess spoil in 12-in. lifts consolidated by compaction equipment. However, in the field it was found that the fine-grained and poorly drained material did not lend itself to compaction, and the specifications were modified to allow end-dumping in lifts of 30-40 ft. The only compaction other than that by gravity was from the equipment used to haul the fill materials over the spoil surface. These spoil dumps, which contained up to 2 million cubic yards of spoil on flat to moderate slopes, allowed for burying vegetative materials in the spoil, had no underdrainage system, and were designed to have sediment ponds within the spoil area and water impoundments on the spoil surface. These practices would not be permitted under the current permanent regulatory program for disposal of excess spoils from coal mining. Yet after 5 years there are no signs of settlement or instability and the density of the spoil materials has reached 85 percent of the undisturbed material (E. Moore, U.S. Army Corps of Engineers, Nashville, Tennessee, written communication, 1981).

Haulage of fill materials down from the excavation site to the fill surface to meet the requirements of this section may necessitate construction of roads outside the fill disposal area at maximum grades, which generates high haulage costs and which can prove hazardous to mine personnel, especially during certain weather conditions. In some cases the building of the roads will necessitate the clearing of vegetation with attendant problems of erosion.

Mass stability is governed by several parameters, including foundation strength, fill natural strength, internal water conditions, and geometric configuration. The requirement in the regulation misses the point that material could be placed in thin lifts and still fail because of other factors, such as foundation conditions. On the other hand, a site having a strong foundation could be constructed safely with higher strength material placed in thicker lifts.

It is evident that there will be conditions under which some or all of the spoil material must be placed in lifts and compacted to achieve stability. There will also be circumstances under which placement in this manner is not needed to stabilize the spoil. There are so many different site conditions, spoil materials, and construction techniques that it is virtually impossible to prescribe one method that will ensure cost-effective construction, stability of the spoil, and environmental protection in all cases.

The requirement that the spoil bank be built to ensure a long term static safety factor (the ratio of forces resisting failure to those leading to failure) of 1.5 raises the following questions:

- Is this requirement justified through technical analysis and scientific data?
- What method is used to calculate the safety factor?
- Does the safety factor cover all types of failures?
- Is a safety factor of 1.5 too conservative for spoil banks in remote places?
- If a design achieves a 1.5 safety factor without compaction or special drainage features, why should such alternative methods not be accepted?

Section 8.2 discusses the considerations and techniques used in determining the desirable safety factor. However, responses to requests from CODES for information (see Acknowledgments) introduced a series of points to be considered in arriving at an appropriate safety factor. None of the responses questioned the need to require a safety factor that would protect the public from the consequences of failure of any structure, whether for safety of people or for protection of the environment. According to M. K. McCarter (University of Utah, Department of Mining and Fuels Engineering, written communication, 1980), the following should be considered:

- Adhering to a specified safety factor cannot possibly cover the infinite variety of conditions to be found in nature. Consequently, the regulations may be too restrictive or not sufficiently restrictive. The latter emphasizes the error of the supposition that the design standards are to help the small operator achieve stable and nondegrading excess spoil embankments whose slopes would not degrade at a faster rate than the natural surroundings. The design standards may help the small operator, but there is also the chance that in some places the standard may be quite wrong for the existing conditions.

- Spoil dumps do not have a well-documented performance history as do earth dams, for which theoretical considerations supporting the 1.5 factor of safety are available. There are many coal, nonmetallic, and metal mining spoil dumps suitable for study, but neither government nor industry has invested sufficient effort to document standard practice concerning construction of waste embankments, particularly of the non-water-impounding type.
- The intent of OSM in specifying a minimum safety factor of 1.5 is clearly an attempt to develop an objective standard as required by law (Fed. Reg. 1979, pp. 15204-150288), but the method of assessing the stability of an embankment is left to "recognized professional standards" (Fed. Reg. 1979, p. 15406). However, there are several accepted analytical techniques that will not necessarily produce the same answers for a given set of circumstances. The regulations contain no specification of peak or residual strength values. The safety factor of 1.5 appears to apply to deep-seated rotational slumping, foundation spreading, and base translation, but there are other failure processes that are not nearly so disruptive. Hence the standards do not properly account for the consequences of all of the various failure modes.
- It is common practice for geotechnical engineers to select the minimum strength characteristics in order to test the design under the most adverse conditions, but there are no assurances that engineers will select minimum strengths. A provision should be included in the regulations that would allow a variance from the 1.5 safety factor if the method of analysis or selection of design parameters was clearly conservative and otherwise allowed adequately for the consequences of possible failure. One way to permit variances and demonstrate compliance with the enforcement provisions of the Act would be to develop a standard evaluation program similar to the guidelines proposed by the Intermountain Region of the Forest Service and the regulatory procedures of the U.S. Geological Survey (see Section 5.5.3).

Acceptance of the analysis for a 1.5 safety factor should include the condition that the slope will not deteriorate, under loading of fill material, from the calculated value. The intent of the regulations is to minimize water pressures and thus increase the safety factor. Compaction is intended to increase cohesion and the angle of internal friction. However, if the fill analysis shows a 1.5 safety factor without compaction and in the presence of ground water, and there are no plans to steepen the slope, it may be unreasonable to require the operator to compact in thin lifts or make elaborate plans to handle water (L.C. Spencer, Utah Department of Natural Resources, Division of Oil, Gas, and Mining, written communication, 1980). Vandre (1980, p. 11) states the following:

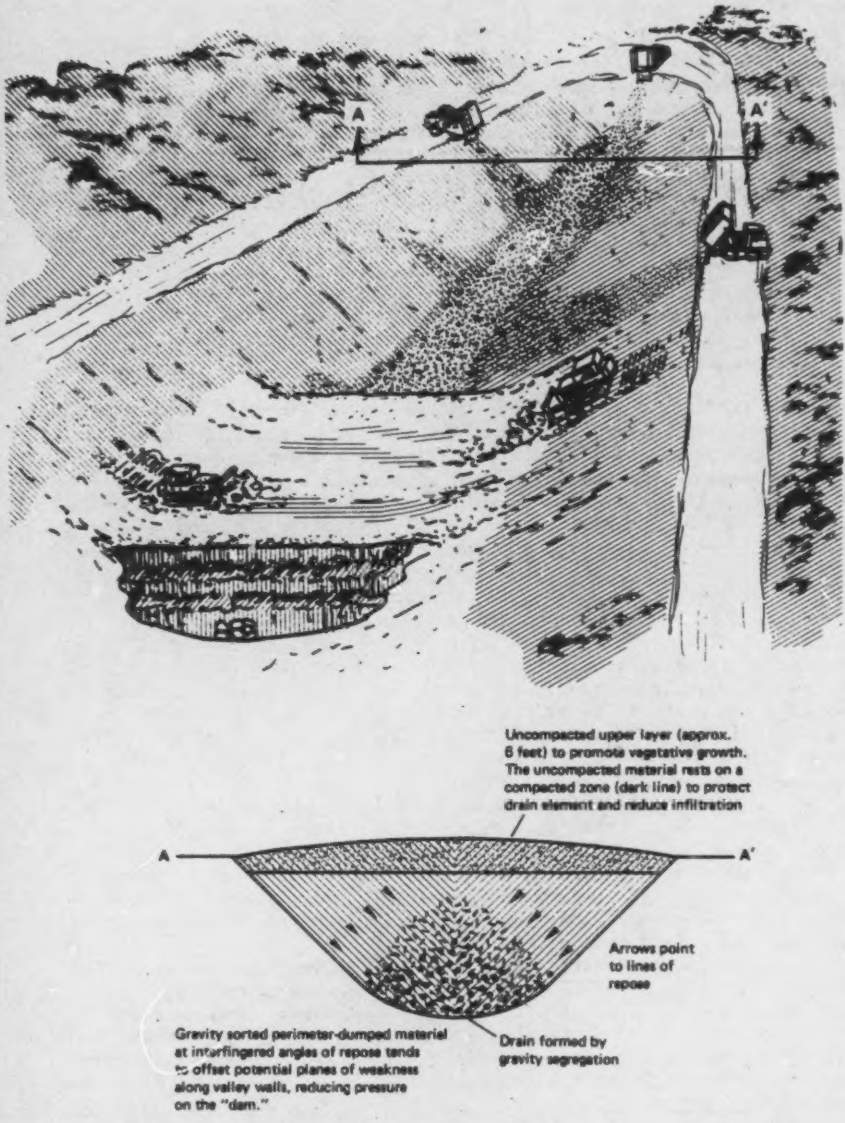
> Frequently, the factor of safety for temporary slopes can be lower than that for the final slopes. This lower safety factor is primarily justified by the

> comparatively short term risk and the better opportunity for remedial and mitigating measures. In the analysis of conditions of extreme loading, such as the maximum probable earthquake acceleration, a factor of safety near 1.0 is considered reasonable. A design which assumes that all the extreme adverse conditions occur simultaneously is not considered to be prudent engineering. For example, assuming saturation because of a drainage system malfunction and a maximum probable earthquake acceleration in the design is too conservative. This compound condition is conceivable but not probable, nor is it historically recorded. The loading conditions considered for design need to be tempered between that which is conceivable with that which is probable.

Vandre (1980) and Y. H. Huang (University of Kentucky, Department of Civil Engineering, written communication, 1980) note the potential for preferred planes of weakness resulting from end-dumping in valley type fills. These are valid and important considerations. However, it seems probable that where the outslope is formed as a dam by reworking and compacting the material in horizontal layers and the rest of the fill is achieved by perimeter dumping, the preferred planes of weakness could be in a contained area in planes perpendicular and at acute angles to the outslope and will be counteracted by the side slope of the natural hill or the perimeter-dumped material on the other side of the valley (see Figure 4.1). This concept needs to be tested to determine if it works in practice, and this could be done under the Experimental Practices Provisions of the Act (§711) and the regulations (§785.13). At most, it seems that the result of failure will be settlement of the spoil surface in some areas. Similar practices are discussed by Skelly and Loy in a report to the DOI (1978) in which three possible concepts are presented: side-dumping with rehandling and compaction in lifts, side-dumping behind a compacted spoil barrier, and side-dumping with physical support construction. Each of these concepts uses side-dumping to help solve problems of cost and safety resulting from truck haulage techniques. Furthermore, they provide design options for the operator to adjust fill construction techniques to site conditions such as overburden characteristics, soil parameters, slope conditions, and size of the fill.

The registered professional engineer experienced in, and qualified to design, spoil fills will be in the best position to determine the appropriate design and construction method to achieve long-term stability. Further, should a mining regulatory agency have reason to doubt any aspect of a design, including its ability to meet performance standards, the agency has the right and obligation to require reanalysis or revision. Some state agencies might provide for rejection of the permit application on the basis of engineering analysis (see Chapter 5).

The potential hazards of fills can be considered in the context of the regulation of dam construction under the Dam Safety Act of 1972. That Act provides for dams to be checked by a professional engineer



Uncompacted upper layer (approx. 6 feet) to promote vegetative growth. The uncompacted material rests on a compacted zone (dark line) to protect drain element and reduce infiltration

Arrows point to lines of repose

Gravity sorted perimeter-dumped material at interfingered angles of repose tends to offset potential planes of weakness along valley walls, reducing pressure on the "dam."

Drain formed by gravity segregation

Cross Section of Fill

Figure 4.1 Sketch showing fill structure constructed by perimeter-dumping method. Locations of potential planes of weakness are shown in cross section A-A'.

whose report is to be submitted to state authorities and to any federal authority, if required (American Consulting Engineers Council 1978). Design engineers and state or federal agencies must come to an agreement on each dam that is built, including the hazard classification under which the dam is to be built. It is important to understand that there is a great difference in hazard classification or potential hazard between dams impounding water and fills for excess spoil, and OSM has apparently not recognized these differences in its regulations, let alone the difference in potential hazard between one fill and another. Probability analysis and risk assessment (Wu and Kraft 1967) could help in developing safe designs for excess spoil fills (see Section 7.5.2.).

Grading to allow surface and subsurface drainage to be compatible with the natural surroundings is important in helping to provide for sufficient soil moisture to support the vegetation normal to the area. To this end, the upper 6 ft of the spoil dump should be open-textured, not compacted. There appears to be an underlying requirement that infiltration of water into any part of the spoil dump is to be avoided, and §816.71(g) prohibits depressions or impoundments on the completed fill (see discussion below).

> §816.71(g) The final configuration of the fill must be suitable for post mining land uses approved in accordance with Section 816.133, except that no depressions or impoundments shall be allowed on the completed fill.

The final configuration of the fill should be suitable for postmining land uses. However, there are practical limitations on such uses. CODES viewed sites on relatively flat slopes with thin lifts, where the intended land use was as a site for commercial and industrial facilities. In these situations, treatment of the spoil area should be a matter of agreement between the mine operator and the developer, provided that the spoil in place in the interim period meets the purposes of the Act.

The presence of small impoundments could add to the quality of the reclamation project and, where appropriate, to the enhancement of wildlife habitats, as in the Tennessee-Tombigbee project. There should not be an absolute prohibition of water impoundments on all fill areas. Rather, the engineer should be allowed to prepare the best design for all aspects of the particular site and should be required to show that where impoundments or depressions are used they will not reduce the stability of the fill, nor contribute acid drainage to ground or surface water.

Note that in head-of-hollow fills (§816.73) a drainage pocket impounding not more than 10,000 ft^3 of water may be maintained at the upper end of the fill to intercept surface runoff. There are conditions under which water impoundments on the fill will not alter its stability. However, in general, water impoundments on the fill can be expected to add water to ground water within the dump and often contribute to saturation of the soil mantle and to shallow slides.

This condition can be reduced or avoided by using a layer of impermeable material under the impoundment or under the upper layer of the fill. In effect, this creates a limited perched water table.

> §816.71(h) Terraces may be utilized to control erosion and enhance stability if approved by the regulatory authority and consistent with Section 816.102(b).

The use of terraces to control erosion is an accepted practice.

> §816.71(i) Where the slope in the disposal area exceeds 1v:2.8h (36 percent), or such lesser slope as may be designated by the regulatory authority based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to stabilize the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed in accordance with Section 780.35(c) to determine the size of rock toe buttresses and keyway cuts.

Keyway cuts, rock-toe buttresses, and similar construction techniques are commonly used to ensure stable fills where foundation testing and other structural analyses indicate that such structures are necessary. The slope of the area on which the fill is constructed is a design-specific factor that cannot be generalized. The need for buttresses and keyway cuts can only be determined on an individual basis through a thorough analysis of the specific problems affecting the stability of the structure. Depending on other factors in the stability analysis, buttresses and keyway cuts may or may not be necessary. The 36 percent slope requirement is too arbitrary. Construction on some slopes of less than 36 percent may require buttresses or keyway cuts, while some slopes steeper than 36 percent may not require either.

> §816.71(j) The fill shall be inspected for stability by a registered engineer or other qualified professional specialist experienced in the construction of earth and rockfill embankments at least quarterly throughout construction and during the following critical construction periods: (1) removal of all organic material and topsoil, (2) placement of underdrainage systems, (3) installation of surface drainage systems, (4) placement and compaction of fill materials, and (5) revegetation. The registered engineer or other qualified professional specialist shall provide to the regulatory authority a certified report within 2 weeks after each inspection that the fill has been constructed as specified in the design approved by the regulatory authority. A copy of the report shall be retained at the mine site.

Inspection by a registered professional engineer or other qualified professional specialist of all phases of spoil dump construction is appropriate; reporting the findings to the regulatory authority is proper and in keeping with the purposes of the Act.

> §816.71(k) Coal processing wastes shall not be disposed of in head-of-hollow or valley fills, and may only be disposed of in other excess spoil fills, if such waste is--
> (1) Placed in accordance with Section 816.85;
> (2) Demonstrated to be nontoxic and nonacid forming; and
> (3) Demonstrated to be consistent with the design stability of the fill.

The regulatory requirements under which coal-processing waste can be placed in excess spoil fills other than head-of-hollow or valley fills are proper. The Act does not specifically exclude coal-processing waste from excess spoil fills, but §515(f) of the Act requires standards applicable to coal waste piles to be developed by the regulatory authority. The Act in §515(b)(22)(B) requires removal of all organic matter prior to spoil placement, but this requirement is understood to refer to vegetative and other organic material in the foundation of the spoil disposal area that needs to be removed for structural reasons. Under the OSM regulations (§816.71(k)), processing wastes would be generally similar to much excess spoil material, and their placement in all fills should not be prohibited as long as structural stability is assured and water quality is protected.

> §816.71(l) If the disposal area contains springs, natural or manmade watercourses, or wet-weather seeps, an underdrain system consisting of durable rock shall be constructed from the wet areas in a manner that prevents infiltration of the water into the spoil material. The underdrain system shall be protected by an adequate filter and shall be designed and constructed using standard geotechnical engineering methods.

Cognizant of the importance of positive drainage systems in appropriate locations, CODES attempted to understand the rationale for the provisions covering drainage but could not comprehend the treatment afforded drainage in the regulations. Infiltration is bound to occur regardless of design and construction methods used, simply because of precipitation, seepage, and ground-water movement. Although an important aspect of any drainage study is an evaluation of natural conditions, this is but part of the picture. Man-made disturbances as a result of mining operations may also cause substantial changes in the hydrology of the surrounding area, but what is important is that the regional hydrology not be adversely affected. More research on this subject is needed (see Appendix B).

The nature of the drainage to be expected after the mining operation begins and after the spoil dump is completed can best be determined by the professional engineers and geologists designing the mining operation and the spoil embankment. It is likely that the postmining drainage condition will change not only from site to site but also from one spoil dump to the next on the same site.

Stable structures can be designed for a 1.5 safety factor even when the phreatic surface (ground-water level) is high (Y.H. Huang, written communication, 1980). Further, depending on site conditions, excess spoil fills constructed by side-, end-, or perimeter-dumping, in which gravity sorting results in a permeable mass, and an effective drain with a natural filter across the bottom of the fill can be designed and built to meet a safety factor of 1.5 in all regions of the country (American Consulting Engineers Council 1978, Vandre 1980). For filtering purposes, to avoid loss of drainage capacity the zone marking the top of the drain formed by gravity sorting (see Figure 4.1) could be graded and compacted, thereby preventing the intrusion of fines from above (Vandre 1980). End- and side-dumped material may provide drainage within the spoil pile to accommodate seeps that could not have been anticipated, thus conveying infiltration water to the blanket drain, whereas layered and mechanically compacted fills could result in perched water tables (Vandre 1980), which under enough hydrostatic pressure could result in drainage through the outslope. CODES also recognizes that in arid and semiarid regions of the country, there is so little precipitation that reclaimed areas and spoil banks actually act as partial collection sites from which surface waters leave surface drainage or descend to the natural water table, which may be several hundred feet below the surface.

The requirement for durable rock underdrains ignores the fact that in many localities the excess spoil materials do not contain durable rock, contain too little of it, or contain it in an excavation sequence that would make it necessary to import the rock to build the underdrains (Y.H. Huang, written communication, 1980). Other drainage systems should be permitted in the regulations.

The underdrainage requirements seem to have resulted in a great deal of overdesign. Designing site-specific drainage systems for anticipated needs could produce equally safe structures at greatly reduced cost, and these methods could be developed under the provisions of §515(b)(22)(C) of the Act.

> §816.71(m) The foundation and abutments of the fill shall be stable under all conditions of construction and operation. Sufficient foundation investigation and laboratory testing of foundation materials shall be performed in order to determine the design requirements for stability of the foundation. Analyses of foundation conditions shall include the effect of underground mine workings, if any, upon the stability of the structure.

The regulatory language used in calling for stability of foundations and abutments and appropriate testing is a performance standard that can and should be met.

> §816.71(n) Excess spoil may be returned to underground mine workings but only in accordance with a disposal program approved by the regulatory authority and MSHA upon the basis of a plan submitted under 30 CFR 784.25.

The return of excess spoil to underground mine workings is a desirable practice, but because of high cost and technical feasibility factors it is seldom possible.

The requirements in §816.71 could have been expanded to cover valley fills, head-of-hollow fills, and durable rock fills, for the general requirements address disposal of excess spoil in steeply sloping areas (e.g., Appalachia). The three sections added (§§816.72, 816.73, and 816.74) repeat many of the design criteria already contained in §816.71.

4.2.2 Disposal of Excess Spoil: Valley Fills

> §816.72 Valley fills shall meet all of the requirements of Section 816.71 and the additional requirements of this Section.
> (a) The fill shall be designed to attain a long-term static safety factor of 1.5 based upon data obtained from subsurface exploration, geotechnical testing, foundation design, and accepted engineering analyses.

In general, a long-term safety factor of 1.5 is reasonable, although it may not be necessary in all cases; see the discussion of §816.71(f) in Section 4.2.1.

> §816.72(b) A subdrainage system for the fill shall be constructed in accordance with the following:
> (1) A system of underdrains constructed of durable rock shall meet the requirements of Paragraph (b)(4) of this Section and:
> (i) Be installed along the natural drainage system;
> (ii) Extend from the toe to the head of the fill; and
> (iii) Contain lateral drains to each area of potential drainage or seepage.
> (2) A filter system to insure the proper functioning of the rock underdrain system shall be designed and constructed using standard geotechnical engineering methods.
> (3) In constructing the underdrains no more than 10 percent of the rock may be less than 12 inches in

> size and no single rock may be larger than 25 percent of the width of the drain. Rock used in underdrains shall meet the requirements of Paragraph (b)(4) of this Section. The minimum size of the main underdrain shall be:

Total amount of fill material	Predominant type of fill material	Minimum size of drain, in feet	
		Width	Height
Less than 1,000,000 yd^3	Sandstone	10	4
Do	Shale	16	8
More than 1,000,000 yd^3	Sandstone	16	8
Do	Shale	16	16

> (4) Underdrains shall consist of nondegradable non-acid or toxic forming rock such as natural sand and gravel sandstone, limestone, or other durable rock that will not slake in water and will be free of coal clay or shale.

The need for a positive drainage system is paramount in areas of high precipitation, but it must be based on a comprehensive hydrological study and be part of the total engineering design. The specification in the regulation of minimum sizes for drains may be beyond actual needs, particularly in areas of low annual rainfall. The regulations should permit engineers to submit designs for drainage systems that will achieve the performance standards and handle all anticipated drainage.

> §816.72(c) Spoil shall be hauled or conveyed and placed in a controlled manner and concurrently compacted as specified by the regulatory authority in lifts no greater than 4 feet or less if required by the regulatory authority to--
> (1) Achieve the densities designed to ensure mass stability:
> (2) Prevent mass movement;
> (3) Avoid contamination of the rock underdrain or rock core; and
> (4) Prevent formation of voids.

The placement of spoil has already been discussed (see Section 4.2.1). The rationale presented by OSM for layered lifts of no more than 4 ft is based on experience with construction of dams, groins, highway embankments, and highway spoil fills (Fed. Reg. 44(50):15206). And yet the American Consulting Engineers Council (1978) and Sherard et al. (1963) point out that high lifts are especially suitable for building dams and highway embankments (see Section 8.5). In the case of dams the structural member for which stability needs to be assured is the dam, not the entire impoundment area behind it. Excess spoil fills can also be constructed by perimeter-dumping behind a dam, as described in Section 4.2.1; see also Figure 4.1. Highway embankments are designed for rigid pavements carrying heavy rolling loads, where any settlement can be a cause of problems. These embankments can also be constructed by dumping because practically all the settlement occurs upon placement of the material (Sherard et al. 1963). The requirement in §816.72(c) could perform its regulatory function by requiring design and construction of spoil fills to achieve the stated regulatory objectives of items (1)-(4).

> §816.72(d) Surface water runoff from the area above the fill shall be diverted away from the fill and into stabilized diversion channels designed to pass safely the runoff from a 100-year 24-hour precipitation event or larger event specified by the regulatory authority. Surface runoff from the fill surface shall be diverted to stabilized channels off the fill which will safely pass the runoff from a 100-year, 24-hour precipitation event. Diversion design shall comply with the requirements of Section 816.43(f).

Diversion of surface runoff from above the fill is a standard practice, particularly during construction. There are several methods for handling surface runoff from the fill area, and the project engineer can design the system best suited to a particular situation.

> §816.72(e) The tops of the fill and any terrace constructed to stabilize the face shall be graded no steeper than 1v:20h (5 percent). The vertical distance between terraces shall not exceed 50 feet.

Presumably, the tops of the fill and any terrace will be prepared for revegetation. For some soil materials the 5 percent maximum allowable grade would produce scouring velocities, although the grade can be less than 5 percent under the regulations. The regulations should consider runoff velocities and allow utilization of low berms and other techniques common in erosion control.

> §816.72(f) Drainage shall not be directed over the outslope of the fill.

Directing drainage away from the outslope is accepted practice unless piped or armored riprap channels are used on the outslope.

> §816.72(g) The outslope of the fill shall not exceed 1v:2h (50 percent). The regulatory authority may require a flatter slope.

A recognized gradient for outslopes is 1v:2h, but the characteristics of the spoil material may make a lesser or greater slope desirable and practical. More stringent design and construction procedures should be justified by the regulatory authority on the basis of stability analysis or need for increased environmental protection.

4.2.3 Disposal of Excess Spoil: Head-of-Hollow Fills

> §816.73 Disposal of spoil in the head-of-hollow fill shall meet all standards set forth in sections 816.71 and 816.72 and the additional requirements of this Section.
>
> (a) The fill shall be designed to completely fill the disposal site to the approximate elevation of the ridgeline. A rock-core chimney drain may be utilized instead of the subdrain and surface diversion system required for valley fills. If the crest of the fill is not approximately at the same elevation as the low point of the adjacent ridgeline the fill must be designed as specified in Section 816.72 with diversion of runoff around the fill. A fill associated with contour mining and placed at or near the coal seam and which does not exceed 250,000 cubic yards may use the rockcore chimney drain.
>
> (b) The alternative rock-core-chimney drain system shall be designed and incorporated into the construction of head-of-hollow fills as follows:
>
> (1) The fill shall have along the vertical projection of the main buried stream channel or rill a vertical core of durable rock at least 16 feet thick which shall extend from the toe of the fill to the head of the fill and from the base of the fill to the surface of the fill. A system of lateral rock underdrains shall connect this rock core to each area of potential drainage or seepage in the disposal area. Rocks used in the rock core and underdrains shall meet the requirements of Section 816.72(b).
>
> (2) A filter system to ensure the proper functioning of the rock core shall be designed and constructed using standard geotechnical engineering methods.
>
> (3) The grading may drain surface water away from the outslope of the fill and toward the rock core. The maximum slope of the top of the fill shall be 1v:33h (3 percent). Instead of the requirements of Section 816.71(g) a drainage pocket may be maintained at the head of the fill during and after

> construction to intercept surface runoff and discharge the runoff through or over the rock drain if stability of the fill is not impaired. In no case shall this pocket or sump have a potential for impounding more than 10,000 cubic feet of water. Terraces on the fill shall be graded with a 3 to 5 percent grade toward the fill and a 1 percent slope toward the rock core.
>
> (c) The drainage control system shall be capable of passing safely the runoff from a 100-year, 24-hour precipitation event, or larger event specified by the regulatory authority.

The rock-core chimney drain was included in the regulations after negotiation by the state of West Virginia and industry with OSM. However, where the spoil material is suitable, the drainage equivalent of a rock-core chimney drain can be achieved through perimeter-dumping. The requirements for other drainage also have been discussed under §816.71(l). The requirements here do not have nationwide application. Any drainage system must be designed to handle regional and site-specific drainage problems.

4.2.4 Disposal of Excess Spoil: Durable Rock Fills

> §816.74 In lieu of the requirement of 816.72 and 816.73, the regulatory authority may approve alternate methods for disposal of hard rock spoil, including fill placement by dumping in a single lift on a site specific basis, provided the services of a registered professional engineer experienced in the design and construction of earth and rockfill embankments are utilized and provided the requirements of this Section and Section 816.71 are met. For this Section, hard rock spoil shall be defined as rockfill consisting of at least 80 percent by volume of sandstone, limestone, or other rocks that do not slake in water. Resistance of the hard rock spoil to slaking shall be determined by using the slake index and slake durability tests in accordance with guidelines and criteria established by the regulatory authority.
>
> (a) Spoil is to be transported and placed in a specified and controlled manner which will ensure stability of the fill.
>
> (1) The method of spoil placement shall be designed to ensure mass stability and prevent mass movement in accordance with the additional requirements of this Section.
>
> (2) Loads of noncemented clay shale and/or clay spoil in the fill shall be mixed with hard rock spoil in a controlled manner to limit on a unit basis concentrations of noncemented clay shale and clay in the fill. Such

materials shall comprise no more than 20 percent of the fill volume as determined by tests performed by a registered engineer and approved by the regulatory authority.

(b)(1) Stability analyses shall be made by the registered professional engineer. Parameters used in the stability analyses shall be based on adequate field reconnaissance, subsurface investigations, including borings, and laboratory tests.

(2) The embankment which constitutes the valley fill or head-of-hollow fill shall be designed with the following factors of safety:

Case	Design condition	Minimum factor of safety
I............	End of construction....	1.5
II...........	Earthquake.............	1.1

(c) The design of a head-of-hollow fill shall include an internal drainage system which will ensure continued free drainage of anticipated seepage from precipitation and from springs or wet weather seeps.

(1)Anticipated discharge from springs and seeps and due to precipitation shall be based on records and/or field investigations to determine seasonal variation. The design of the internal drainage system shall be based on the maximum anticipated discharge.

(2)All granular material used for the drainage system shall be free of clay and consist of durable particles such as natural sands and gravels, sandstone, limestone or other durable rock which will not slake in water.

(3) The internal drain shall be protected by a properly designed filter system.

(d) Surface water runoff from the areas adjacent to and above the fill shall not be allowed to flow onto the fill and shall be diverted into stabilized channels which are designed to pass safely the runoff from a 100-year, 24-hour precipitation event. Diversion design shall comply with the requirements of Section 816.43(f).

(e) The top surface of the completed fill shall be graded such that the final slope after settlement will be no steeper than 1v:20h (5 percent) toward properly designed drainage channels in natural ground along the periphery of the fill. Surface runoff from the top surface of the fill shall not be allowed to flow over the outslope of the fill.

(f) Surface runoff from the outslope of the fill shall be diverted off the fill to properly designed channels which will pass safely a 100-year, 24-hour precipitation event. Diversion design shall comply with the requirements of 816.43(f).

(g) Terraces shall be constructed on the outslope if required for control of erosion or for roads included in the approved post mining land use plan. Terraces shall meet the following requirements:

(1) The slope of the outslope between terrace benches shall not exceed 1v:2h (50 percent).

(2) To control surface runoff each terrace bench shall be graded to a slope of 1v:20h (5 percent) toward the embankment. Runoff shall be collected by a ditch along the intersection of each terrace bench and the outslope.

(3) Terrace ditches shall have a 5 percent slope toward the channels specified in paragraph (1) above unless steeper slopes are necessary in conjunction with approved roads.

This is the most realistic section of the regulations and was achieved after much negotiation between OSM and industry. Comments made previously on drainage apply to durable rock fills.

It should be noted that a workable definition of "durable rock" is difficult to determine; appropriate laboratory tests should be utilized (or developed) upon which to base such a definition (see Appendix B). Care should be taken to see that loads of noncemented clay and shale are distributed around the perimeter of the fill to mix them with the hard-rock materials. With experience gained in disposal of excess spoil materials, there may be instances where the grade of the outslope between terraces could be more than 50 percent, but a 50 percent slope could be too steep for some materials.

4.2.5 Overall Assessment of the Regulations

As was discussed in Sections 4.2.1-4.2.4, SMCRA established a rigid framework for setting regulatory standards of excess spoil disposal and other environmental protection standards to control adverse effects resulting from surface coal mining operations. The Act also established an unreasonable schedule for developing the regulations implementing the Act. As a result, the regulations in general fail to recognize the diversity and complexity of interactions among geological, hydrological, and ecological systems. The goal of uniform and nationwide design standards results in regulations under which enforcement is unreasonable and often impractical (NRC 1981).

The Act and the regulations appear to be primarily a reaction to past practices or the result of a lack of understanding of sound engineering practices (see Chapter 8). They are restrictive in terms of the state of the art and do not encourage the adoption of newly emerging technology. Although there is some flexibility in the regulations, CODES finds that there is not sufficient flexibility to encourage improving the methods of disposing of excess spoil. In the absence of adequate baseline data, regulators tend to set standards that are more stringent than necessary. Regulations should be modified as more detailed data become available. Unfortunately, there is a reluctance to reduce the stringency of regulations once they are in place (Ancker-Johnson 1981).

There are no occasions known or reported to CODES where an excess spoil fill constructed according to the OSM regulations that require a 1.5 safety factor had a massive failure. However, it must be realized that this experience with the regulations is short, dating only from 1978.

In following the required "cookbook" procedures, it is assumed that the 1.5 safety factor is achieved. However, the ultimate stability of the fill for the most part, is unknown (EPA 1979). The factor of safety should be determined analytically prior to construction. Without reviewing each individual spoil disposal structure with respect to stability analysis, it is impossible to state categorically that current regulations are resulting in structures that meet the requirements of the regulatory program. Sections 816.72, 816.73, and 816.74 do require stability analyses, but there is concern about adequate review by regulatory agencies.

Much of the data available for reviewing various disposal practices that have been developed both before and after SMCRA are qualitative in character, for example, the EPA (1979) and the DOI (1978) studies, and CODES does not know of quantitative data substantiating the levels of stability required. However, EPA is currently conducting detailed technical evaluations (EPA, manuscript in preparation) to supplement its earlier studies.

It is not possible to say whether the regulations represent overdesign or underdesign. But it can be said that the Act and the regulations have imposed severe limitations on the consideration of sound alternative methods appropriate to some sites and therefore limit the professional engineer in his ability to deal with and certify the design of the excess spoil fill embankment. In the long run, this could be a costly alternative to regulations based on performance standards.

There are honest differences of opinion about the best way in which to achieve the purposes of the Act. There is a need for a reevaluation of the methods and procedures to ensure that the purposes of the Act are met, and the viewpoints of all parties involved should be considered.

4.3 REGULATIONS REGARDING HYDROLOGIC IMPACTS

4.3.1 Diversion of Surface Runoff and Stream Channels

Diversion of surface runoff and stream channels is required to avoid water contamination from mined or other disturbed areas. Diversions must be approved by OSM.

4.3.1.1 Runoff Diversions Section 816.43 of the regulations includes specific criteria for the construction and maintenance of temporary and permanent overland and shallow ground-water flow diversions. These specifications, which were developed by EPA, require temporary runoff diversions designed to handle the runoff from a maximum precipitation event recurring over a 2-year period. This regulation is unclear because no storm duration is specified. Permanent runoff diversions must handle the runoff from a maximum precipitation event that recurs over a 10-year period. This specification suffers from the same lack of clarity as the one mentioned above; that is, the storm duration is not specified.

In addition to diversions of water from the mine site, permanent diversions are required in valley-fill construction and for conveying surface runoff into sedimentation ponds. All channel diversions must be designed, constructed, and maintained to prevent the contribution of additional suspended solids to the natural streamflow. The following channel criteria must be met for all designs:

1. Channel lining must be used; if riprap is used, it must meet the standards for durability under §816.72.
2. Minimum freeboard in the diversion channel must be 0.3 ft.
3. Energy dissipaters are required wherever excessive channel velocities occur at the receiving stream.

OSM regulations require permanent diversions to be constructed with gently sloping banks that are stabilized with vegetation. Although asphalt, concrete, and similar materials may be used, the most commonly used linings in the past have been grass and riprap. Grass channels require less work, but the slope is more restricted. In addition, it takes time to develop grass channels fully to protect the channel bottom and sides, and many channels require some type of artificial lining until the grass is mature. Table 4.1 illustrates the slope and velocity capacities common to grass-lined channels.

Temporary channels generally do not include a lining, and they are constructed without design standards. Commonly used temporary diversions include the following:

- Interceptor channel--a combination ditch and ridge constructed perpendicular to the slope within or immediately adjacent downslope from the mine site.
- Interceptor dike--a ridge of compacted earth constructed across the slope below the outslope.
- Diversion dike--soil pushed upslope and dumped at the top of the slope.
- Diversion ditch--a channel constructed across a slope to reduce slope length and convey runoff to a protected outlet.

In general, the provisions of §816.43 seem reasonable and workable, and these regulations have been met without any major problems.

TABLE 4.1 Permissible Runoff Velocities for Channels Lined with Grass*

Type of cover	Slope range (percent)	Permissible velocity (feet per second)	
		Erosion-resistant soils	Easily eroded soils
Bermuda grass	0- 5	8	6
	5-10	7	5
	10	6	4
Buffalo grass, Kentucky bluegrass, smooth brome, blue grama	0- 5	7	5
	5-10	6	4
	10	5	3
Grass mixture	0- 5	5	4
	5-10	4	3
	Do not use on slopes steeper than 10 percent		
Lespedeza sericea, weeping love grass, ischaemum (yellow bluestem), kudzu, alfalfa, crabgrass	0- 5	3.5	2.5
	Do not use on slopes steeper than 5 percent, except for side slopes in a combination channel		
Annuals - used on mild slopes or as temporary protection until permanent covers are established, common lespedeza, Sudan grass	0- 5	3.5	2.5
	Use on slopes steeper than 5 percent is not recommended		

SOURCE: Modified from U.S. Soil Conservation Service (1967).

*The values apply to average, uniform stands of each type of cover. Use velocities exceeding 5 feet per second only where good covers and proper maintenance can be obtained.

4.3.1.2 Stream Channel Diversions Stream channel diversions require special authorization from OSM. They must meet stringent design and construction standards set forth in §816.44 of the regulations. The overall emphasis of these criteria is on stable channel design and construction to minimize erosion and the transport of sediment in the new channel.

For temporary diversions the combined area of stream channels, banks, and floodplain must be adequate to pass the peak runoff from a 10-year, 24-hour precipitation event. Permanent stream diversions must safely pass the 100-year, 24-hour precipitation event. The channel capacity for permanent diversions must be equal to or greater than the capacity of the unmodified channel both above and below the diversion. When a stream is restored after mining, it must be returned to a geomorphically stable configuration or its natural meandering course with natural vegetation along the banks and with the approximate natural pattern of riffles, pools, and drops that approximate the premining stream channel characteristics. The aquatic habitat must also be restored.

The regulations in §816.44 appear to be reasonable and prudent, except for those situations in which there would be a change in valley slope, because the channel would be unstable if it were restored to its original condition on a changed valley slope.

4.3.1.3 Water Effluent Limitations Under §816.42, all surface drainage from the area disturbed by mining, including disturbed areas that have been reclaimed, must pass through a sedimentation pond before leaving the permit area. The quality of the water discharged from sedimentation ponds must meet the conditions of all the applicable state and federal laws and regulations. At a minimum it must meet the effluent limitations shown in Table 4.2, which were developed by EPA, even though they may not be realistic on a site-specific basis.

Discharges from the disturbed areas are not subject to the effluent limitations if (1) the discharge results from a precipitation event greater than the 10-year, 24-hour precipitation event (the greatest amount of rain that can be expected to fall once every 10 years and takes at least 24 hours to run off the surface) for the area and (2) the discharge is from a sediment pond constructed and maintained according to OSM criteria.

The effluent limitations shown in Table 4.2 take no note of the fact that background water quality in many cases is worse than the quality that would be produced by following the effluent limitations prescribed in the regulatory program. More data are needed, especially data developed since passage of SMCRA. However, it can be said that an allowable maximum concentration of 70 mg/l for total suspended solids is a very stringent specification under which OSM could shut down most mining operations during a 10-year, 24-hour precipitation event. The runoff from many natural watersheds, particularly those in eastern Kentucky and western West Virginia, could not pass the 70 mg/l specification. The sources of total suspended solids in these watersheds are probably farming operations and natural landslides. If the water coming down the stream channel originates in a watershed

TABLE 4.2 OSM Effluent Limitations for Water Discharged from Sedimentation Ponds

Effluent Characteristics[1]	Maximum allowable[2] (milligrams/liter)	Average of daily values[6] (milligrams/liter)
Iron, total	7.0	3.5
Manganese, total[3]	4.0	2.0
Total suspended solids[4]	70.0	35.0
pH	Within range of 6.0 to 9.0[5]	

[1] To be determined according to collection and analytical procedures adopted by the Environmental Protection Agency's regulations for wastewater analyses (40 CFR 136).

[2] Based on representative sampling for 30 consecutive discharge days.

[3] The manganese limitations shall not apply to untreated discharges which are alkaline as defined by the Environmental Protection Agency (40 CFR 434).

[4] In Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming, total suspended solids limitation will be determined on a case-by-case basis, but they must not be greater than 45 mg/l (maximum allowable) and 30 mg/l (average of daily value for 30 consecutive discharge days) based on a representative sampling.

[5] Where the application of neturalization and sedimentation treatment technology results in inability to comply with the manganese limitations set forth, the regulatory authority may allow the pH level in the discharge to exceed to a small extent the upper limit of 9.0 in order that the manganese limitations will be achieved.

[6] For 30 consecutive discharge days.

SOURCE: Modified from Department of Energy (1979).

where mining is mixed with nonmining areas, the discharge must still meet the required effluent limitations. Regional water effluent standards developed through cooperation between federal and state regulatory agencies would be a more reasonable and flexible approach to the protection of water quality.

Adequate facilities must be maintained to treat all water discharged from the areas disturbed by mining so that its quality complies with the applicable state, federal, and OSM effluent limitations. To maintain the specified pH level of 6.0, OSM regulations call for the use of an automatic neutralization process for all acid mine discharges. A mine that produces fewer than 500 tons of coal per day, and others than can ensure timely and consistent treatment, may be permitted to use a manual neutralization system.

These effluent limitations are EPA regulations required to be enforced by OSM. The variance provision for the effluent limitations contained in §816.42 has been suspended by court action. OSM is reevaluating them in connection with EPA's revision of effluent limitations.

4.3.2 Sedimentation Ponds

Under §816.46, sedimentation ponds are to be used individually or in a series and are to be constructed before any disturbance of the drainage area around the pond occurs. However, reductions in the size or number of sedimentation ponds necessary for timely reclamation of disturbed areas may be possible.

4.3.2.1 Sediment Storage Volume Section 816.46(b) requires sediment storage volume to be equal to 3 years of accumulated sediment as calculated by the universal soil loss equation (USLE), gully erosion rates, and sediment delivery ratios. Another method of computing sediment storage volume is to provide 0.1 acre-ft of storage volume for sediment per acre of disturbed area. Alternatively, the required sediment storage volume may be reduced to a minimum of 0.035 acre-ft per acre disturbed if the operator can demonstrate that sediment removal by on-site measures will reduce the sediment yield.

Current use of the USLE by the OSM for the sizing of sediment pond volumes presents several difficulties in application that are covered in Section 7.3.1.4 of this report. In spite of these difficulties, use of the USLE can probably be justified on the ground that it is the best available method, provided it is kept in mind that calculated sediment volumes may be greatly in error. Also, ponds constructed according to the regulatory program do not relieve the operator from the effluent limitations for storms smaller than the 10-year, 24-hour event.

4.3.2.2 Sedimentation Pond Detention Times Design of sedimentation ponds is based on a 10-year, 24-hour precipitation event. The maximum detention time required for runoff is 24 hours (§816.46c). Theoretical detention time is defined as the average time that the designed flow is detained in the pond; it is further defined as the time difference between the centroid of the inflow hydrograph and the centroid of the outflow hydrograph for the designed event. The required detention time may be reduced to a 10-hour minimum if the operator can demonstrate that a modified pond design will increase the sediment removal efficiency of the pond, and if the operator is able to achieve and maintain applicable effluent limitations. The 10-hour detention time may be further reduced in areas where the size distribution or the specific gravity of suspended particles is such that a rapid settling will occur. Detention times hinge on the specific gravity or size distribution of the suspended solids; the finer the materials, the longer the time necessary for sedimentation. Runoff from some areas where the topsoil has a large clay fraction requires long detention times because the particles are very fine. In this situation, chemical treatment may be used to reduce the detention time by flocculating the fine particles. These variations in sediment storage volume and detention times give the operators essentially six options for complying with the sedimentation pond requirements. The options are summarized in Table 4.3. Accumulated sediment must be removed when it occupies 60 percent of the designed sediment volume, although some variation is allowed.

4.3.2.3 Design and Construction Requirements The design, construction, and inspection of all sedimentation ponds must be under the supervision of a registered professional engineer. Design specifications include spillway capacity, pond freeboard, pond dam width, embankment slopes, and a minimum safety factor. The minimum safety factor is 1.5 for dams exceeding 20 ft in height for ponds with a total volume of 20 acre-ft or more. Construction of the ponds must include clearing and grubbing, topsoil removal, scarification of the embankment foundation, controlled placement of embankment materials, and seeding and mulching. A combination of principal and emergency spillways is required such that the pond can safely pass the runoff from a 25-year, 24-hour precipitation event. The minimum elevation at the top of the settled embankment must be 1 ft above the principal spillway level. One part of the pond regulations (§816.46(g)) specifies that water shall not escape through a pond's emergency spillways during the runoff from a 10-year, 24-hour or smaller precipitation event. This regulation means that ponds will now have to be larger than ponds constructed before 1977 when SMCRA was passed. Larger ponds--those with an embankment more than 20 ft in height or storing 20 acre-ft or more--require extra design limits. These design criteria are set forth by the Mine Safety and Health Administration (30 CFR 77.216).

The design, construction, and maintenance of sedimentation ponds and other control measures in accordance with OSM regulations do not relieve an operator from meeting the effluent limitations of §816.42. In other words, even though approval may be granted for a sedimentation pond design with less than a 24-hour detention time, the operator remains responsible for the effluent quality from all storms less than the 10-year, 24-hour precipitation event.

TABLE 4.3 Options for Complying with Sedimentation Pond Storage Requirements Under OSM Design Criteria

Option	Sediment storage volume	Runoff detention time
Conventional pond design, no on-site sediment controls	0.1 acre-feet/acre	24 hr.
Conventional pond design, with on-site sediment controls	0.035 acre-feet/acre	24 hr.
Modified pond design, no on-site sediment controls	0.1 acre-feet/acre	10-24 hr.
Modified pond design, with on-site sediment controls	0.035 acre-feet/acre	10-24 hr.
Modified pond design with chemical treatment, no on-site sediment controls	0.1 acre-feet/acre	<10 hr.
Modified pond design with chemical treatment, with on-site sediment controls	0.035 acre-feet/acre	<10 hr.

SOURCE: Modified from Department of Energy (1979).

Under certain conditions and with approval from OSM, ponds can be built in perennial streams, although this practice is discouraged. Natural background stream turbidity for ponds built on perennial streams may create some compliance problems for operators. To ensure that the effluent quality is not affected by background water quality, it may be necessary to divert the stream around such onstream ponds so that only surface runoff is actually entering the pond. The regulations make no allowance for turbidity coming from unmined areas.

Sedimentation ponds cannot be removed until all the revegetation requirements are met and the drainage entering the pond satisfies the applicable state and federal water quality requirements for the receiving streams. This is commonly interpreted to be the background levels of the receiving streams. Permanent sedimentation ponds may be approved by OSM.

Substantial portions of §816.46(b) dealing with sedimentation pond design have been suspended by OSM. These suspended regulations are being reevaluated by OSM in connection with EPA's reanalysis of effluent limitations.

4.3.3 Ground-Water Protection

Section 816.50 specifies the requirements for protecting ground water from acid mine drainage and other toxic overburden materials. This regulation is relatively straightforward and not controversial. Section 816.51 regulates the ground-water recharge capacity, specifying that mining reclamation must restore the approximate premining recharge capacity to a condition that supports the approved postmining land use and minimizes disturbances of the prevailing hydrologic balance. In actual practice, however, recharge capacity is difficult to determine.

Section 816.52 specifies the requirements for surface- and ground-water monitoring for both quantity and quality. Monitoring is designed to keep track of infiltration rates, subsurface flow, and soil storage characteristics in a manner approved by OSM. Where important aquifers are affected, monitoring must include measurements from wells and analysis of overburden, aquifer, and spoil. The difficulties in monitoring water infiltration rates are discussed in Working Paper III.

The surface-water monitoring program requires quarterly reports to OSM. Monitoring of flow and quality must continue after regrading and stabilization to show that the quality and quantity of runoff without treatment are acceptable to OSM. These data are used by OSM for deciding when water-quality and flow-control systems can be removed. If water quality does not meet the applicable standards, OSM must be notified. Discharge of surface waters into underground mines is generally banned, except where the mine operator can show that discharge will reduce hazards to the public, will meet the water effluent limitations except for pH, and will not contaminate other water.

4.3.4 Stream Buffer Zones

Under §816.57 of the regulations, no surface mining is permitted within 100 ft of a perennial stream or a stream with a biological community. To be considered a stream with a biological community a stream must, at any time, contain two or more species of arthropods or molluscan animals that (1) are adapted to the flowing water for a part or all of their life cycle, (2) depend on the flowing water habitat, (3) reproduce or can be reasonably expected to reproduce in the stream, and (4) are longer than 2 mm at some stage of their life cycle in the flowing stream.

If the original stream channel is to be restored and if the water quality will not be adversely affected, mining may be allowed at distances of less than 100 ft from a stream or even through the stream itself. And as was noted above, streams may even be temporarily or permanently diverted with the approval of OSM.

4.4 ENVIRONMENTAL CONSEQUENCES OF THE REGULATIONS

On the basis of a comprehensive analysis of the permanent OSM regulatory program, SMCRA (Fed. Reg. 44(50):15311-15463), and the final Environmental Impact Statement of the permanent regulatory program implementing §501(b) (DOI 1979), the environmental benefits of SMCRA and of the OSM regulations have been generally positive. The law and the regulations have tended to mitigate the major adverse environmental impacts associated with surface coal mining.

However, there are certain, minor, exceptions. Possible adverse environmental impacts because of SMCRA, or OSM regulations, or both, include the following:

- Topsoil handling and respreading. This regulation involves topsoil removed from the mined area, from roads, from disposal areas, from drainage diversions, and for the construction of sedimentation ponds. It is possible that the additional handling involved in salvaging, stockpiling, and respreading topsoil, as required by §515(b)(5) of the Act, increases adverse environmental consequences, such as deterioration of air quality, increased soil erosion, reduction in soil productivity, and increased stream sedimentation.
- Road standards. Short-term adverse impacts result from large areas being disturbed during road construction.
- Runoff and stream channel diversions. Under the permanent regulatory program, runoff and stream channel diversions disturb a larger area than they did under pre-SMCRA conditions; this disturbance may have an adverse effect on wildlife and water quality and may increase soil erosion. However, stream diversions above a valley fill reduce potential erosion from the fill.

The intent of regulations covering stream channel diversions is to be sure that streams do not run through active mining areas. Runoff is also controlled so that it does not go over the outslope of the fill embankment. Providing for these diversions, however, disturbs surrounding areas and results in erosion and sedimentation.

- Head-of-hollow fills. Under the permanent regulatory program, clearing and grubbing of the entire area of the fill prior to the construction of the fill leaves a large area of natural soil exposed to erosion. This could be offset by the progressive clearing of hollow fill disposal areas because this would not be in conflict with current regulations.

The practice of burning weedy debris from the fill area may also have an adverse impact on air quality, although this is not a regulatory requirement.

- Removal of semipermanent impoundments. Removal of semipermanent impoundments at the conclusion of mining, as required by the Act (§515(b)(10)(C), may have an adverse influence on wildlife and aquatic life that have become established in the impoundments and benefit from their existence.

4.5 COSTS ASSOCIATED WITH THE OSM REGULATIONS AND ALTERNATIVE METHODS OF EXCESS SPOIL DISPOSAL

Among the most emphasized objections to OSM regulations for the disposal of excess spoil are those that center on the increased costs of compliance with the OSM rules over the cost of following alternative engineering practices, referred to by industry as good engineering practice (GEP), in the design and construction of head-of-hollow fills and valley fills. In an attempt to obtain cost information based on the actual experience of coal mining companies operating in Appalachian regions where head-of-hollow and valley fills are being constructed under OSM regulations, the National Coal Association and the American Mining Congress were invited to ask member companies to supply such data to CODES. Five sets of operating-cost data were supplied to CODES. Owing to the nature of the data, it was deemed advisable to use a third-party (the accounting firm of Coopers and Lybrand) to receive the data and remove all company identification before submission to CODES. This procedure was designed to avoid inappropriate disclosure of proprietary information. Costs used by CODES were only those chargeable to head-of-hollow- or valley-fill construction, although data were also submitted on box-cut spoil disposal (see Appendix A). Table 4.4 shows cost information from one respondent and the manner and detail in which it was supplied to CODES. Table 4.5 presents a summary showing the total costs for the reporting companies as well as pertinent comparative information from a study made by D'Appolonia Consulting Engineers for OSM (DOI 1980).

In each case the operator provided the actual cost of operating in compliance with OSM regulations and a calculated cost of performing the same functions following GEP, which in every case is designed to produce the same result, that is, a stable, environmentally acceptable fill structure. CODES did not evaluate the suitability or appropriateness of the industry's proposed alternative engineering practices for meeting the requirements of the regulations or the

TABLE 4.4 Company A Cost Data for Disposal of Excess Spoil*

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre**	$ total	$ per yd3 or acre	$ total
1. ENGINEERING COSTS				
a) Investigation		1,000		1,000
b) Testing		2,000		5,000
c) Design		2,000		2,000
d) Inspection and certification		3,000		3,000
e) Stability analysis				10,000
2. SITE PREPARATION				
a) Removal of vegetation	1,600/acre	38,400	1,600/acre	38,400
b) Removal of topsoil and organic matter	400/acre	10,000	Not removed	
c) Construction of keeway cuts or rock toe buttresses		1,000		3,000
3. ROAD CONSTRUCTION **	35.27/ft	130,500 for 3,700/ft		
4. CONSTRUCTION OF ROCK UNDER-DRAINS AND FILTERS OR CHIMNEY DRAINS		5,000		5,000
5. CONSTRUCTION OF DIVERSION CHANNELS FOR SURFACE RUNOFF	Not done			15,000
6. DRILLING AND BLASTING OPERATIONS				

TABLE 4.4 Company A Cost Data for Disposal of Excess Spoil* (Continued)

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre**	$ total	$ per yd3 or acre	$ total
7. HAULAGE OF SPOIL*	$0.46/yd^3$	1,513,100	$0.09/yd^3$	298,000
8. SPOIL SPREADING AND COMPACTION	$0.06/yd^3$	192,000	$0.03/yd^3$	96,000
9. CONSTRUCTION OF TERRACES FOR EROSION CONTROL AND STABILITY		8,800		39,120
10. COVERING, GRADING, TOPSOILING AND SEED PREPARATION	600/acre	14,400	1,200/acre	28,800
11. REVEGETATION	390/acre	9,360	390/acre	9,360
12. OTHER (PLEASE SPECIFY) Pond Construction		15,000		15,000
13. GRAND TOTAL	☒	1,945,560	☒	568,680

*The following assumptions were made in the development of the data:

1) All costs are adjusted to reflect July 1, 1980 dollars.
2) All costs reflect requirements of the OSM permanent program regulations (unamended and without regard to the actions of the courts in remanding, enjoining or overturning them).
3) Costs estimated for alternative construction methods are based upon best engineering estimates.
4) General overhead costs are factored into the individual cost factor items.
5) Sites selected for analysis were typical sites without special problems which would tend to skew the cost figures.

See Appendix A for additional tabulation of cost data.

**Road construction (item #3) is given in $/ft.

SOURCE: Data provided through the National Coal Association and American Mining Congress, 1981.

TABLE 4.5 Summary of Cost Data for Excess Spoil Disposal

Company	Cost under Office of Surface Mining regulations (OSM)	Cost under alternative engineering practices (GEP)	Cubic yards of fill
A	$ 1,945,500	$ 568,680	3.3 x 10^6
B, Fill 1	6,846,100	6,220,700	10.46 x 10^6
B, Fill 2	5,804,900	5,099,900	6.8 x 10^6
C	6,421,084	4,552,554	9.8 x 10^6
D	10,659,735	3,356,592	10.5 x 10^6
D'Appolonia	621,000	Base Case	2.28 x 10^6
(Appalachia #2)	1,378,000	Alternative (e)	2.28 x 10^6

	Cost under Office of Surface Mining regulations (¢/yd^3) (OSM)	Cost under alternative engineering practices (¢/yd^3) (GEP)	Incremental cost difference for GEP (¢/yd^3)
A	58.95	17.23	-41.72
B, Fill 1	65.45	59.47	- 5.98
B, Fill 2	85.37	74.99	-10.38
C	65.52	50.58	-14.94
D	103.43	31.97	-71.46
D'Appolonia[a]	27.23	Base Case	-27.23
	60.44	Alternative (e)	-60.44

SOURCE: Basic data provided by individual companies through the National Coal Association and the American Mining Congress, 1981; D'Appolonia data from Office of Surface Mining (U.S. DOI 1980)

[a] For D'Appolonia, OSM costs are for alternative (a); GEP costs are for alternative (e).

objectives of the Act (see Appendix A). The data indicate higher costs for compliance with OSM regulations than for GEP, as would be expected when hauldown transport and mechanical compaction are contrasted to downslope dumping and gravity compaction.

An examination of the individual cost summaries from the National Coal Association/American Mining Congress survey (see Appendix A for the summaries) shows that for the specific cost items listed, costs for GEP were higher than those for OSM for a majority of the operators for three items: engineering, construction of diversion channels for surface runoff, and construction of terraces for erosion control and stability. For five tasks the majority found GEP costs lower than OSM: site preparation, road construction, construction of rock underdrains and filters or chimney drains, spoil haulage, and spoil spreading and compaction. Three of these--haulage, spreading and compaction, and road construction--are the most costly operations in excess spoil disposal. Together they account for 60-95 percent of the total cost of this aspect of surface mining in steep-slope areas.

The final regulatory analysis prepared by OSM as required by Executive Order 12044 is based on the study made by D'Appolonia Consulting Engineers (DOI 1980). The report identified 41 discretionary issues involved in drafting the permanent regulations and made engineering cost studies of 36 of them. Three of the cost studies covered disposal of excess spoil.

For the purposes of the study, D'Appolonia used a scenario of seven model mines. Two mines, identified as Southern Appalachia Contour Haul Back (No. 1) and Southern Appalachia Mountaintop Removal (No. 2), are those for which the costs of alternative methods of handling excess spoil are given and for which costs are compared to those given by the industry sources. These representative mines were chosen on the basis of regional characteristics for the six mining regions studied. Production rates and coal seam characteristics were determined by use of statistical data, and experience with the mining industry throughout the United States provided the basis for the physical settings associated with each mine model that was selected. The type of mining represented by the two model mines accounted for 99.2 million tons of production, equal to 27.9 percent of U.S. production of surface-mined coal in 1975.

To compare the industry cost figures with the D'Appolonia estimates of the costs of alternatives, all costs were recalculated to cost per cubic yard of fill material handled, a more equitable way of comparing the costs of regulation than costs per ton of coal mined. The latter measure is so dependent on the thickness of the particular coal seam or seams being mined that it is difficult to draw meaningful comparisons.

Perhaps the most striking feature of Table 4.5 is the range of incremental cost differences between OSM and GEP. For this comparison, GEP for the D'Appolonia base case (lowest-cost method) alternative is taken as alternative (e), gravity placement (dumping); see DOI (1980). One additional comparison between costs estimated by D'Appolonia (DOI 1980) and reported by industry is that for fill drainage systems. The D'Appolonia study estimates drainage costs at 1.25 cents ($0.0125) per cubic yard of fill for underdrains and 7.06 cents ($0.0706) per cubic yard for a rock chimney drainage system for the model mine for southern Appalachia. The industry cost reports do not differentiate between underdrains and rock chimneys, but do show a difference between OSM requirements, presumably underdrains, and GEP ranging from 0.15 cents ($0.0015) per cubic yard of fill to as much as 2.76 cents ($0.0276) per cubic yard of fill.

While the unit cost differences between OSM and GEP are small--measured as they are in cents per cubic yard of material handled--the total incremental costs for the life of a mine are substantial. For model mine No. 2, producing 300,000 tons per year for 5 years and handling 2.28 million yards of fill material per year, the total incremental costs of OSM over GEP could amount to as much as $6.89 million, or $4.59 per ton of coal, or $0.60 per cubic yard of fill.

The incremental costs of conforming to OSM requirements provided by industry bracket the range of costs estimated for OSM by D'Appolonia (DOI 1980) at the time the regulations were promulgated. However, the range of cost estimates in the survey data provided for this study is considerably wider than the estimates available to OSM. In addition, there is no assurance that the survey undertaken for this report captured the extremes of the actual distribution of costs or that the average incremental costs for the industry fall near the average of either the OSM or the independent survey data.

It is clear that the regulations imposed sometimes considerable incremental costs over and above the costs that the industry estimates would be incurred to achieve the same objective if greater latitude in choosing reclamation methods were permitted. It is also clear that the incremental costs imposed by the regulations are not uniform across firms or areas. The result is that impacts on income and capital values are different and that some areas and operations experience far greater impacts than others.

Competitive relationships within the industry were therefore changed in the short run, with some operations losing some or all of their economic viability and some areas and types of mining losing out competitively to others. The data from the independent survey suggest that if the same regulatory objectives can be achieved at a lesser cost than the costs required by OSM procedures then a change in the competitive position of some coal companies can result when the costs borne by some companies are larger than others. These differences, plus the fact that the industry believes it can achieve the same objectives at less cost, explain some (but not all) of the vigorous industry response to the regulations.

As has been pointed out, the OSM regulations have provided certain environmental benefits. However, formal cost-benefit analyses of the OSM regulations are extremely difficult to make because environmental benefits generally do not lend themselves easily to quantification.

In determining the effectiveness of the OSM regulations, costs and benefits must be kept in mind, if only in a qualitative sense. Imposing costs on the coal industry in excess of the expenditures necessary to achieve public purposes results in a reduction of the competitiveness of coal with other energy resources in both the short and the long term. The data from the survey give reason to believe that, to an undetermined extent, this is precisely what has happened in the case of coal. That is, because of a primary concern for difficulties of enforcing a performance-standard regulatory approach, OSM adopted an approach that has apparently raised costs above those necessary to protect the environment (see Section 3.3).

Furthermore, by prescribing certain practices, the regulations have necessarily proscribed the use of others. In this way, too, they have restricted the use of available technology and, perhaps more importantly, restrained the development of new methods. By prescribing the methods to be used in disposing of excess spoil, the regulations in effect have frozen the technology of disposal, thus preventing the industry or individual coal operators from improving their competitiveness. For a social point of view, that could prove to be the most costly aspect of the regulatory approach adopted by OSM.

4.6 PRE-SMCRA STATE REQUIREMENTS COMPARED WITH SMCRA REGULATORY REQUIREMENTS

A detailed discussion of various state regulatory practices prior to 1977 compared with interim regulations promulgated under SMCRA is contained in "Development of New Design Concepts for Construction of Valley Fills" (DOI 1978). Table 4.6 from this report summarizes the principle differences between SMCRA and the four central Appalachian states of Kentucky, Tennessee, Virginia, and West Virginia. The table covers nine parameters: site restrictions, site preparation, construction design, construction method, internal drainage system, internal drainage composition, internal drainage size, external drainage system, and sediment pond and discharge. The DOI (1978) report discusses each of these parameters in detail.

Although the pre-SMCRA excess spoil disposal requirements of the individual states are similar in many respects, they are at the same time significantly different from each other and from OSM requirements in a number of areas, for example, construction design and construction method. However, the site preparation and environmental control requirements are quite similar.

For construction design, OSM calls for and Virginia and West Virginia called for a 20-ft-wide bench on the fill outslope, with OSM and West Virginia specifying a bench for every 50 ft of vertical height, and Virginia specifying 40 ft of vertical height between benches. Tennessee regulations called for a bench of unspecified width for every 25 ft of vertical height, and Kentucky called for a 30-ft-wide bench for every 100 ft of vertical height. OSM specifies an outslope of 50 percent or less; Kentucky specified 25-50 percent; and neither Tennessee nor Virginia specified the angle of outslope, although Virginia demanded no more than a 100-ft outslope distance between benches. The reader is reminded that all of these construction design specifications are aimed at achieving the same objective, that is, a safe, stable, and environmentally acceptable fill structure, although no provisions are made to accommodate the design to different

TABLE 4.6 Comparison of Valley-Fill Design Standards Required by the Federal Office of Surface Mining and the States of Kentucky, Tennessee, Virginia, and West Virginia

REGULATORY AGENCY	SITE RESTRICTIONS	SITE PREPARATION	CONSTRUCTION DESIGN
FEDERAL (OSM)	The disposal site shall be near the ridge top. Spoil shall be placed above a natural terrace, bench, or berm, if such placement provides additional stability.	All organic material shall be removed from the disposal area and the topsoil must be removed and segregated. Organic material may be used as mulch or may be included in the topsoil.	Terraces shall be constructed to stabilize the face of the fill. Terrace bench at least 20 feet wide every 50 feet vertical. The outslope of the fill shall not exceed 1v:2h (50 percent).
KENTUCKY	No toe of fill shall be: . On natural hillside bench . Where slope of hollow channel is $> 10^{0}$ Fill is not permitted on natural spring unless approved drainage system is constructed. Fill must be > 100 feet from public water.	All organic material must be removed. Rock structure check dam between toe and basin	Terrace bench at least 30 feet wide every 100 feet vertical. V - Hollow outslope < 200 feet. U - Hollow outslope < 400 feet.
TENNESSEE	Treated hollow must be completely filled. Fill must be > 100 feet from public water.	All organic material must be removed. Vegetation windrowed below toe of fill.	Terrace bench every 25 feet vertical.

TABLE 4.6 (Continued)

REGULATORY AGENCY	SITE RESTRICTIONS	SITE PREPARATION	CONSTRUCTION DESIGN
VIRGINIA	Fill is not permitted over underground mine openings or continuously flowing streams. Treated hollow must be completely filled.	All organic material must be removed. Vegetation windrowed below toe of fill.	Bench - 20 feet wide every 40 feet vertical no > 100 feet slope distance.
WEST VIRGINIA	Narrow V-shaped hollow at ridge top. No underground mine openings or wet weather springs. Treated hollow must be completely filled. At least > 100 feet from public water.	All organic material must be removed. Vegetation windrowed below toe of fill.	Terrace bench 20 feet wide every 50 feet vertical height.

TABLE 4.6 (Continued)

REGULATORY AGENCY	CONSTRUCTION METHOD	INTERNAL DRAINAGE SYSTEM
FEDERAL (OSM)	Spoil shall be transported and placed in a controlled manner and concurrently compacted in lifts that are less than 4 feet thick. The final configuration of the fill must be suitable for post-mining land uses.	A system of underdrains constructed of durable rock shall be installed along the natural drainage system, shall extend from the toe of the fill and contain lateral drains to each area of potential drainage or seepage.
KENTUCKY	Narrow V-shaped hollows: end dumped material pushed down in layers by dozer to $\leq 20^{\circ}$ outslope every 48 hours. "U" shaped hollows: spoil hauled down and placed in 4 foot lifts. No acid producing material in fill. Maintain outslope toward hillside and down stream.	Narrow V-shaped hollow, spoil and rock material end dumped at coal seam level to permit gravity separation. Wide U-shaped hollow, rock material hauled down and placed.
TENNESSEE	Spoil compacted in horizontal layers to a maximum 6 feet thickness per layer. Upper horizon of fill should be suitable for vegetation. Acid bearing material should be covered by 4 feet of fill.	5 foot thick drainage blanket constructed of large rocks, from toe to upper surface of fill.

TABLE 4.6 (Continued)

REGULATORY AGENCY	CONSTRUCTION METHOD	INTERNAL DRAINAGE SYSTEM
VIRGINIA	Rock Core Type: • Constructed in 6 foot compacted layers • Fill construction begins at toe Blanket Underdrain Type: • Construction by side or end dumping	Rock Core: • Constructed through entire fill Rock Blanket: • Gravity separation by end or side dumping
WEST VIRGINIA	Bench – 20 feet wide every 40 feet vertical, no > 100 feet slope distance. Fill deposition begins at toe. Maximum thickness of lift 4 feet.	Rock Core: • Constructed through entire fill

TABLE 4.6 (Continued)

REGULATORY AGENCY	INTERNAL DRAINAGE COMPOSITION	INTERNAL DRAINAGE SIZE			
		Fill Size (cy)	Predominant type of fill material	Minimum drain size (ft.)	
				Width	Height
FEDERAL (OSM)	No more than 10 percent of the rock may be < 12 inches in size and no single rock may be > 25 percent of the width of the drain. No rock shall be used in underdrains if it tends to disintegrate and clog the drain or if it is acid-forming or toxic-forming.	<1 million	Sandstone . . .	10	4
		<1 million	Shale	16	8
		>1 million	Sandstone . . .	16	8
		>1 million	Shale	16	8
KENTUCKY	All drainways filled with rock to provide french drains.	—			
TENNESSEE	—	—			
VIRGINIA	. No acid bearing material within 50 feet . No shale or slate material in core Rock Core: 50% must be ≥ 24" in ø Rock Blanket: 90% must be ≥ 12" in ø	Rock Core: . 16 feet wide Rock Blanket: . Durable rock placed by rehandling in valley if separation is deficient			
WEST VIRGINIA	. At least 90% of rock must be > 12" in ø	. Minimum 16 foot width			

TABLE 4.6 (Continued)

REGULATORY AGENCY	EXTERNAL DRAINAGE SYSTEM	SEDIMENT POND AND DISCHARGE
FEDERAL (OSM)	The tops of the fill and each terrace shall be graded $\leq$ 1v:2h (5 percent) to drain surface water to the sides of the fill where stabilized surface channels off the fill shall carry drainage away from the fill. Drainage shall not be directed over the outslope.	Below fill with storage capacity of 0.2 AF/disturbed acre, plus storage volume for retention of a 10 year, 24 hour precipitation event. Effluent guidelines: Daily Avg. / Daily Max. pH: 6.0-9.0 / 6.0-9.0 T. Iron: 3.5 mg/l / 7.0 mg/l T. Manganese: 2.0 mg/l / 4.0 mg/l TSS: 35.0 mg/l / 70.0 mg/l
KENTUCKY	All surface drainage from the undisturbed area above the fill shall be diverted away from the fill. Downstream outslope $\leq 20^{\circ}$. Top of fill crowned, cross graded 1-2% to hillside. Drainway gradient at toe $\leq 10^{\circ}$.	Below toe of fill with storage capacity of 0.2 AF/acre of disturbed area. Basin discharge criteria: · pH 6.0-9.0 · Iron < 7 mg/l · Turbidity $\leq$ 150 JTU (or 330 ppm s.s.); $\leq$ 1,000 JTU (2,200 ppm s.s.) after precipitation · No settleable matter · Total alkalinity > total acidity
TENNESSEE	Outslope $\leq 30^{\circ}$. Crown fill, cross grade to side. Crown terraces, cross grade to side. Diversion ditches around fill, all ditches sloping > 5° rock lined or rock filled.	Below toe of fill with storage capacity of 0.125 AF/acre of disturbed area. Basin discharge criteria: · pH 6.0 - 9.0 · Total iron $\leq$ 1.5 mg/l · Settleable solids $\leq$ 1 mg/l · Suspended solids $\leq$ 100 mg/l · Sulfate $\leq$ 1,400 mg/l · Manganese $\leq$ 10 mg/l

TABLE 4.6 (Continued)

REGULATORY AGENCY	EXTERNAL DRAINAGE SYSTEM	SEDIMENT POND AND DISCHARGE
VIRGINIA	Outslope $\le$ 2:1. Rock Core Type: · Drainage Pocket (< 10,000 ft.^{3}) at head · Grade Bench 2-5% to head, 2-5% to core · Grade top $\le$ 5% to pond Blanket Underdrain: · Crown top, cross grade 2-5% or slope to one side Grade bench 2-5% to face and side.	Below toe of fill with storage capacity of 0.125 AF/acre of disturbed area.
WEST VIRGINIA	Drainage pocket (maximum 10,000 ft.^{3} at head of core). Outslope $\le$ 2:1. Terrace bench - 3-5% toward fill, 1% to core. Top of fill sloped to head of hollow maximum slope 3% in any direction.	Below toe of fill with storage capacity of 0.125 AF/acre of disturbed area. Basin discharge criteria: · pH 5.5 - 9.0 · Iron $\le$ 10 mg/l · Turbidity $\le$ 1,000 JTU after 4 hours and $\le$ 200 JTU after 24 hours of major precipitation (½" rainfall in 30 min.)

SOURCE: U.S. Department of the Interior (1978).

local conditions unless it is assumed that the differences in the state specifications reflect different local conditions.

This brief discussion illustrates the variations in regulatory requirements and the degree of specificity included in these pre-SMCRA and current OSM requirements. A detailed discussion of all the material in the table is not possible here; the reader is referred to the DOI (1978) report for a more complete discussion of the differences and similarities of the five sets of regulations.

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Chapter 5

AN ALTERNATIVE REGULATORY APPROACH

5.1 INTRODUCTION

This chapter discusses the issues surrounding the Surface Mining Control and Reclamation Act (SMCRA) and the regulations as well as the problems encountered by the Office of Surface Mining (OSM) in adopting the existing regulatory program, including the costs and benefits associated with excess spoil disposal and other environmental protection standards of SMCRA and its regulations. An alternative to the existing OSM regulatory program is presented here, based in part on regulatory methods used to implement other federal laws that are described in the last section of this chapter.

5.2 ISSUES SURROUNDING THE OSM REGULATIONS

Numerous issues surround the Surface Mining Control and Reclamation Act of 1977 and the regulations developed to implement it. Certain problems have developed because of overlap and inconsistency between federal and state regulations (U.S. Regulatory Council 1981). But many simply feel that OSM regulations are too rigid, and reactions to the Act and to the OSM regulations have been strong, mixed, and sometimes diametrically opposed. The published record of these reactions is voluminous--reports of congressional hearings (U.S. Congress, House 1977a, 1979; U.S. Congress, Senate 1979), court records, numerous articles in the public press and special interest journals (Galloway and McAteer 1980). More than a hundred legal challenges to the Act and the interim and permanent regulations have been filed, and numerous court decisions have been announced. Most of the decisions were appealed. Many of the issues have been resolved, although about a dozen challenges remain and are still pending. Galloway and McAteer (1980, p. 305) summarize the criticism of opponents of the regulations as follows:

> The surface mine regulations in the United States have been bitterly criticized by industry and the various coal producing states for their detail, complexity, and alleged inflexibility. States and the industry argue strenuously that the regulations

require a "cookbook" approach to mining and needlessly drive up costs by billions of dollars. Industry contends that the regulations should only set broad environmental goals and allow industry to determine how best to meet the goals.

Although The litigation continues, certain general points relevant to this study have already been decided, although they are subject to further possible court action (see, for example, Surface Mining Regulation Litigation, 452 F. Supp. 338 (D.D.C. 1978) and 456 F. Supp. 1301 (D.D.C. 1978); Permanent Surface Mining Regulation Litigation 627 F. 2d 1346, 1355 (D.C. Cir. 1980)).

- The courts thus far have affirmed OSM's authority to promulgate detailed regulations, such as design criteria, to carry out the purposes of the Act.
- Detailed design specifications promulgated for nationwide application (such as "cookbook" rules on valley and head-of-hollow fills, underdrains, and sedimentation ponds) can, however, be challenged on technical grounds related to specific site conditions.
- Some regulations which specify more stringent requirements or broader application than provided by SMCRA have been challenged successfully on grounds that OSM has exceeded its authority. For example, one court remanded part of the regulation designed to regulate dams impounding waste when it concluded that the Act provided only for regulating dams or embankments using waste. Similarly, one court held that since SMCRA requires a 300-ft buffer zone between blasting operations and an occupied dwelling, OSM cannot extend this to a 1,000-ft buffer zone.
- Some of the gaps and overlaps between OSM regulations and those of other regulatory agencies are being adjusted by court action. For example, if EPA provides certain exceptions to the regulations controlling discharges of suspended solids, OSM may not supersede EPA's judgment by enforcing stricter standards. Similarly, in situations where EPA decides to not enforce--e.g., in the case of regulations applicable to lands being actively mined when lands are under reclamation--OSM may not enforce a stricter standard.
- The exemptions to certain provisions in the Act may not be circumscribed or ignored by OSM--e.g., limiting the small-acreage exemption in the alluvial valley floor or failing to acknowledge the exemption from hydrologic damage for undeveloped rangelands.
- OSM's jurisdiction over the surface disturbances resulting from underground mining have been affirmed by the courts, but the courts have also affirmed that regulations must be interpreted reasonably. For example, a firm commitment to a postmining land use 40 years in advance of the cessation of mining cannot be required, and neither can the segregation of topsoil for reclamation 40 years hence. It would be unreasonable to apply the "approximate original contour" requirement to an area which, over the life of the mine, has gradually subsided and become revegetated.
- Many of the states' claims strike at the framework of the regulations and the position of the states within that framework. So

far, the courts have found that state programs must meet the requirements of SMCRA and OSM regulations, including the permitting and bonding requirements.

The economic issues surrounding the added costs of complying with the regulations have not been resolved, but the impact of OSM regulations has resulted in quite different costs at different mines and in different regions (see Section 4.5).

5.3 ANALYSIS OF PROBLEMS IN ADOPTING SMCRA'S REGULATORY APPROACH

The legislative history of SMCRA (see Section 3.2 and Working Paper II) indicates that the Act was originally intended to provide federal assistance to the states, without federal domination, in developing programs for the regulation of surface mining. The variety of conditions under which coal mining takes place in this country makes it logical to use a regulatory approach that could be adapted to regional conditions (NRC 1981). However, as evidence of ineffective state regulation became apparent, Congress became doubtful of the capability of the states to adopt and enforce satisfactory programs under a federal act (U.S. Congress, House 1977b). Congress enacted strict and detailed standards to ensure that its legislative goals would be carried by state and federal regulatory authorities (see Section 3.2). Although the Act provides that the states have the primary responsibility for developing and enforcing regulations under the Act because of the diversity of terrain, climate, and geology, the Act gives overriding authority for implementing and enforcing the regulations to the Secretary of the Interior and specifies uniform standards to be met in the conduct of all coal mining operations. There are, however, some exceptions, such as those for conditions west of the 100th meridian, for alluvial valley floors, and for release of bonding upon successful revegetation over a 5-year or 10-year period, depending on rainfall. Guidelines to the states for an acceptable state program became detailed mandatory standards that states had to adopt as their own.

Thus there is an inherent dichotomy in the Act resulting from an attempt to uphold state primacy while moving toward stringent federal control. The primary reason for state initiative--the diversity of terrain, climate, and geology--became secondary to the need for uniformity for the purpose of ease of enforcement (see Sections 3.2 and 3.3).

SMCRA was also passed in part to address the problem of disparate competitive positions between companies that were not required to meet the same reclamation standards. However, there will be inherent differences between reclamation costs in the Appalachian Region and those in the Midwest or the West because of differences in terrain, climate, geology, and mining method. The provisions of the Act dealing with excess spoil disposal reflect this dichotomy. There are only general provisions for excess spoil resulting from mining in flat terrain or rolling terrain of gentle relief (§515(b)(3)), i.e., where the amount of "overburden and other spoil and waste materials" is in excess of that needed to restore the approximate original contour. Yet there are stringent, detailed standards for excess spoil disposal associated with steep-slope mining and for mountaintop mining where restoration to the approximate original contour has been waived.

These standards (§515(b)(22)) were added late in the development of the Act to mitigate the significant environmental problems associated with these operations, especially in Appalachia. Other parts of SMCRA deal with significant problems in other regions, e.g., alluvial valley floors and prime farm land. The goal of uniformity of regulation sought by the Act did not, however, anticipate the difficulty and controversy that would ensue when such largely regional standards would be applied uniformly wherever similar operations would be conducted. Significant differences in natural conditions would be expected to exist within the region for which they were especially designed and in other areas of the county where the provisions would also be applicable.

The problem of applying uniform regulations was compounded when OSM chose to adopt specific design standards and criteria to implement the Act's standards. They were made mandatory and applied on a nationwide scale, largely ignoring differences in terrain, climate, and geology. The regulations adopted by OSM--unlike the regulations adopted under the Federal Mine Safety and Health Act (see Section 5.5)--were adopted without a long history of accepted engineering practice in the field, and hence without the benefit of comprehensive, long-term data upon which to base the standards. As a result, the promulgation of detailed design standards, the technical basis for which could be rationally debated on both sides, was probably more responsible than any other action for the opposition to the regulations.

OSM requires each state regulatory authority to adopt regulations that are "at least as stringent" as the federal regulations as a condition for OSM approval of a state program (30 CFR §810.4). This provision elaborates on the statutory requirement in §503(a)(7), which requires each state program to contain "rules and regulations consistent with regulations" issued by the Secretary of the Interior. OSM's "state window" provision was an attempt to permit a state to adopt alternative regulatory provisions (see Section 3.3.3).

Some states, however, are actively working to obtain the right to adopt a regulatory approach of their own, differing from OSM's approach but providing the same degree of safety and environmental protection as SMCRA's §515 standards. Such an alternative is generally recognized as desirable, but some people are concerned about whether or not such equivalent protection can actually be achieved. Senate passage in 1979 of the Rockefeller Amendment (S. 1403), which would allow the states to adopt a program requiring adherence to the provisions of the Act rather than to the regulations, is an indication of that effort (see Section 3.3).

The lack of trained staff in the states and in OSM to review engineering designs and reclamation plans and to monitor compliance probably was important to OSM's conclusion that it had to promulgate regulations containing design standards and criteria that were both mandatory and specific.

In only a few subjects, such as blasting practice, did OSM have available an excellent data base and experience on which to draw in setting technological standards; in framing other standards, a comprehensive, long-term data base was unavailable. Furthermore, the legislative history points out that OSM had little time to consider setting criteria based on regional conditions because of statutory deadlines in issuing regulations. Technical data submitted during the rule-making process were prepared quickly, as were the regulations, and were not used as thoroughly as they might have been. The restrictive schedule was one constraint; an inadequate number of technically qualified staff was probably another.

The setting of technical standards or design criteria by a governmental body frequently engenders problems between the regulator and the regulated. When conflict occurs, it leads to challenges to the standards which, in many instances, the regulatory authority finds difficult to defend on the basis of technical data alone. The successful challenge to OSM's interpretive ruling issued April 6, 1980 (Fed. Reg. 45, p. 25998) elaborating on durable rock-fill requirements was a good example of the coal industry's ability to mount convincing technical arguments in favor of another design that meets the standards of SMCRA.

Furthermore, prescribing certain practices in effect freezes the technology, which prevents operators from improving their competitive positions by adopting more cost-effective methods. When costs are imposed on the coal industry in excess of expenditures necessary to achieve public purposes (i.e., benefits), a reduction of coal's competitiveness with other energy sources could result. The implications of these short- and long-term effects on the coal industry and on the nation as a whole could prove to be the most costly aspect of OSM's regulatory policies (see Section 4.5).

An approach to regulation that uses design standards and criteria invites confrontation and in the long run defeats the objectives of the legislation by focusing on technical questions while losing sight of the goal. On the other hand, a desirable approach is one that accomplishes the same degree of public safety and environmental protection within a flexible regulatory framework that allows the technology to develop. To achieve these goals, an effective process for timely decision making is needed both on an operational and on an administrative level. The desirability of meeting regulatory goals in a more flexible and less burdensome manner and the advantages and disadvantages of alternative ways of meeting regulatory goals are described by the Environmental Protection Agency (EPA 1980). The U.S. Regulatory Council (1981) notes the advantages of a performance-standard approach that provides for regulatory flexibility.

5.4 AN ALTERNATIVE REGULATORY APPROACH

The Committee suggests that OSM adopt a performance-standard regulatory program that contains five basic components. To elicit the best response in meeting the objectives of SMCRA and at the same time make better use of existing and emerging engineering and scientific knowledge, technical assistance units and regional guidelines are recommended (see sections 5.4.2.1 and 5.4.2.2). Ways of strengthening the scientific and engineering content of OSM activities are contained in Sections 5.4.2.3 and 5.4.2.4, data collection and personnel and training, respectively. The Committee also suggests the use of economic incentive, in Section 5.4.2.4, to aid in achieving the social and environmental goals of SMCRA. Before the alternative regulatory approach of CODES is discussed further, some general considerations are given below.

5.4.1 General Considerations

Various regulatory approaches are available to compel industry or individuals to internalize the costs imposed on society as a result of some specific activity, such as coal mining. In the case of coal mining, such undesirable effects include water pollution and the structural failure of dams, impoundments, or waste disposal piles. The NRC (1979) has discussed five general methods to control mining activities and the use of mined land. In order of increasing preemption of public over private control, they are as follows:

- Technical assistance. This method is based on making the benefits of basic and applied research available to mine operators through educational programs. In this way, awareness and operational knowledge of the effects of mining are improved, the adoption of methods to protect against environmental degradation during mining are promoted, and reclamation following mining can be demonstrated.
- Economic incentives. Effluent charges, tax benefits, and other forms of incentives can also be used to meet public objectives.
- Regulation of results. This approach stipulates desired results in terms of the conditions that are to be achieved following mining and reclamation, or in terms of the conditions that are to be maintained in the environment during and following mining. "Performance standards" is another term that is used to describe this approach, but in many cases the term is misapplied because "practices to be followed" are mistakenly specified as performance standards.
- Regulation of practices or means. This approach stipulates the practices that an operator must use during mining and reclamation, as is generally done under SMCRA. "Design standards" is a term used for this method of regulation.
- Public ownership of surface rights. Public ownership places direct control of mining activities in the hands of the public through a governmental agency directed and empowered to perform the activity.

These methods or techniques may be used in a variety of combinations because they are not mutually exclusive. In the section that follows, CODES sketches a regulatory approach incorporating a combination of techniques that it believes would minimize many of the difficulties of the present system while accomplishing the goals of

SMCRA. Under such an approach, both the regulators and the regulated should be able to function more effectively and efficiently in achieving the goals of the Act, but there are likely to be some initial difficulties during the transition period.

The final environmental impact statement concerning the permanent regulatory program listed several alternatives to some parts of the regulatory program (DOI 1979). One of them was to establish a regulatory program based on objectives or goals. However, such a goal-oriented program could not be more general than allowed by the provisions of SMCRA. The final environmental impact statement points out that the particular alternative should have negligible direct adverse environmental impacts. On the other hand, it might have short-term, indirect adverse environmental consequences because of a lack of state staffing and expertise to implement a performance-oriented approach.

5.4.2 Main Elements of the Alternative Regulatory Approach

An enforceable regulatory policy is needed to elicit the best planning and construction responses in achieving the goals of SMCRA, and a regulatory approach that encourages technical effectiveness and efficiency by means of increased flexibility should lead to a more satisfactory relationship among OSM, the states, and the coal mining industry. The suggested approach of CODES incorporates protection of the environment and public health and safety with flexibility for site-specific conditions; it also promotes technological innovation and thereby helps to avoid many of the short- and long-term effects on competitiveness within the coal industry and between alternate energy sources.

Some of the most satisfactory regulatory schemes have concentrated on establishing goals, coupled with a sound process for decision making, rather than on specification of technical practices (see Section 5.5). Performance standards provide a more effective mechanism than design standards for complying with regulations, because there is built-in flexibility (U.S. Regulatory Council 1981). In the environmental area, where design and technology are often still in the experimental and developmental stages, both the regulatory agency and those who are regulated need encouragement and the opportunity to adapt technology as it evolves, which would help maintain the economic viability of the industry. Although a goal-oriented approach would help remove unnecessary regulatory constraints, it cannot put all companies on the same competitive basis. There are competitive disparities due to various aspects of a coal mining operation—e.g., location, geology, and structure of coal deposits. There are also disparities inherent in the economics of the marketplace, as between large and small companies.

In dealing with the natural environment it is rarely possible to predict all of the conditions (such as hydrologic and geologic details below soil zones) beyond the range of direct observation.

One of the most important advantages of regulations calling for performance standards rather than regulations that establish design specifications is that they allow for technological innovation, and this helps to avoid imposing higher costs than necessary on the industry (and the consumer) to protect the public and the environment. Under performance standards, operations can also be modified during construction to adjust to conditions that differ from those assumed in preparing the design (see Section 8.2).

For these reasons, CODES believes that a regulatory approach that is goal-oriented, adopts certain minimum mandatory performance standards, suggests design criteria as guidelines (nonmandatory), encourages technological innovation, and ensures that the regulatory staff is qualified to review and approve plans submitted by mine operators would benefit the public more in the long run than the current method of regulation and enforcement. CODES therefore suggests that OSM promulgate revised regulations in the form of performance standards that apply nationwide. If this recommendation is followed, it might require that some portions of the Act be amended. Engineering design plans developed by operators would be submitted for review and approval as part of the permit application's reclamation plan, and particular attention should be paid to the need for a timely review and approval process.

5.4.2.1 Technical Assistance Units Technical assistance units are needed to strengthen the regulatory activities of OSM and the states through feedback of technical information bearing on improved performance, and they are also needed to work with coal operators who request assistance in dealing with technical problems related to SMCRA. Technical assistance units would make the benefits of basic and applied research available to mine operators, thus fostering the development and the transfer of new technology. These units should be field-oriented, and staffed and equipped to make studies at operating sites. They could also operate as research centers or laboratories to investigate reclamation problems in coordination with other federal and state research laboratories. The OSM research centers would be expected to pursue investigations not normally undertaken by other federal laboratories.

There need be no more units than there are distinctly different types of mining regions and regulatory problems--perhaps an eastern and a western unit would suffice, or an eastern, a midwestern, and a western unit might be needed. Although there are considerable differences within these regions, it would be useful to have some kind of subdivision for regional convenience in carrying out regulatory functions. Such a regional organization would facilitate interaction on an operational level between OSM, state regulatory agencies, and coal operators. The units should be made up of people with sound backgrounds in relevant areas--engineering and scientific disciplines and economics--and with practical experience in surface mining and civil engineering. Each unit should be able to draw freely on the advice of other experts from industry, professional associations, academic institutions, the states, and the public at large. Advisory groups within the technical units should be able to travel and provide on-site technical advice and guidance to both state regulatory authorities and mine operators.

OSM would not directly prepare plans or engineering designs (e.g., for an excess spoil structure or a sedimentation pond) for any specific facility. However, advice including alternate technologies to meet the requirements of SMCRA would be available to all operators through the technical units. The Small Operator Assistance Program (SOAP) could be expanded to provide financial aid to smaller operators who do not have access to all the expertise necessary to comply with regulations.

CODES recognizes the importance of technical assistance, but also recognizes that such assistance would be only one component of OSM's several activities.

5.4.2.2 Regional Guidelines The first task of the technical assistance units should be to determine the method of implementing the revised regulatory performance standards, as suggested by CODES above, as well as standards relating to data requirements for permit applications, taking into account the range of conditions within a particular region. These units should therefore possess special expertise for evaluating the goals of SMCRA's §515 standards and the regulatory performance standards, and should be able to apply them in the context of regional conditions. The experience of state and other federal agencies, mine operators, local communities, and environmental groups should be sought in making these evaluations. Regional guidelines, which could be published as manuals, would give mine operators regional design guidance and objectives based on particular conditions within a given mining region. This review and recommendation function would be purely technical, based on findings of fact and sound calculations that would include economic as well as engineering and scientific factors. In essence, OSM would have under one program a set of guidelines corresponding to each individual region, with each region's guidelines meeting, at a minimum, the goals of SMCRA's standards.

5.4.2.3 Data Collection This report has noted numerous gaps and inadequacies in scientific and engineering information (see Appendix B). Many of the gaps require the collection of relevant data from carefully selected sites or areas over sufficiently long periods of time to establish credible trends, cycles, and ranges. Each technical assistance unit should collect (or arrange for the collection of) data to fill the gaps judged to be most important in its region. To plan and carry out a program of data collection that will effectively serve OSM, coal operators, and the public, it will be necessary to consult and coordinate with other federal and state agencies, regional research organizations (such as universities, institutes, and museums of natural history), mining companies and associations, and interested, technically oriented individuals. An OSM data-collection program would naturally focus on data more directly related to surface coal mining reclamation problems than other programs. The OSM program would focus on needed data not now collected by other government programs.

The value of data on natural phenomena in most cases depends to a considerable degree on the length of the time series covered by the collection. It is therefore preferable to start immediately with a few, well-conceived tasks rather than to delay until an elaborate and comprehensive program has been agreed upon by all interested parties. The program can be enlarged as staff and funds become available.

By way of illustration: a technical unit could select a group of comparable basins or watersheds, some unmined and some undergoing mining, for collecting data on precipitation and surface water and ground water. Additional tasks could be added to the basin studies as needs and opportunities presented themselves; those tasks could include data collection on such topics as characteristics of air flow, vegetation, wildlife, and aquatic biota. At some point the availability of the data would inevitably lead to its use in research and would provide answers to various important questions.

5.4.2.4 Personnel and Training The technical background and the adequate, but not excessive, number of a regulatory authority's personnel are major factors in determining its ability to judge whether an operator's mining plan, including designs for disposal structures, is capable of meeting the performance standards set for such operations. In-house technical capabilities enable a regulatory authority to monitor closely and accurately the actual performance of the industry. In achieving administrative flexibility in both the permit review and enforcement functions, it is important for the regulatory authority's personnel to have the ability to interpret regulations on a case-by-case basis.

The number of personnel used should be adequate to cover necessary review, inspection, enforcement, and other tasks. An excess of regulatory personnel can unnecessarily burden the regulated, and an inadequate number can hinder the effectiveness of OSM in carrying out its responsibilities.

OSM could advise on minimum standards for qualifications of state and federal inspectors and for the personnel responsible for reviewing and approving permit applications. At a minimum, CODES suggests that these individuals have field experience and a sound education in directly relevant disciplines; regulatory staff involved in review of geotechnical designs should also have appropriate professional licenses or certification. Special training could be provided to update these skills; there could also be cooperative programs with academic institutions and on-the-job apprenticeship training for students and new employees. The object should be to obtain a well-balanced staff composed of individuals who have a firm grasp of their respective disciplines, tempered by the realities of field experience. The staff responsible for approving permits or monitoring enforcement would possess the disciplinary mix relevant to the technical factors on which an operational plan or engineering design is based. Compensation should be comparable to that for alternative employment opportunities. Allowing decisions to be based on individual judgment and discretion is another important factor in attracting and keeping qualified personnel and assuring quality performance.

To expand the level of training of field personnel in both state and federal regulatory agencies, OSM could increase its current training program and adapt to its purposes some of the broad training and educational programs developed by other federal agencies and industry. These range from short periods of on-site instruction to university courses. The development of such a program would stimulate and facilitate such relevant training activities by OSM, industry, professional associations, state regulatory authorities, and academic institutions.

The technical background of professional personnel in the industry is also important to the success of a regulatory approach that allows flexibility in design. The Act recognizes the important role of professional engineers in certifying the design of structures for the disposal of excess spoil, for example. Industry and professional associations should be encouraged by OSM and state regulatory authorities to adopt training programs geared to update and enlarge the engineering and scientific skills needed to plan and carry out mining operations related to SMCRA. Industry and professional organizations should work closely with OSM and academic institutions in developing educational programs appropriate to the needs of surface coal mining as related to SMCRA.

5.4.2.5 Economic Incentives Selective use of economic incentives is another way to help achieve the objectives of the legislation and to promote further trust in industry's reliability in meeting them.

Economic incentives, such as lower bonding costs on subsequent operations when performance standards have previously been met in a first-class manner, might prove effective. First-class performance might be defined as operations that met regulatory guidelines or that, through innovation, achieved the same or better results. Such incentives could spur improved performance while at the same time encouraging innovation. Reliability of performance might thus be enhanced without stifling technological development.

5.5 REGULATORY METHODS USED UNDER OTHER FEDERAL ACTS

This section outlines the regulatory approaches adopted by the Mine Safety and Health Administration (MSHA) in implementing the Federal Mine Safety and Health Act of 1977, and those proposed by the Environmental Protection Agency (EPA) in implementing the Resource Conservation and Recovery Act of 1976. Even though the regulatory activities of these agencies were promulgated under quite different laws and are not entirely free of controversy and litigation, they are relevant to this report because similar technical uncertainties and variability in site-specific conditions are inherent in these two acts. More importantly, they are based on goal-oriented procedures, which is the approach favored by CODES for OSM's regulatory program. Also briefly noted is the framework within which the U.S. Geological Survey supervises mining operations that deal with the same kinds of technical problems that OSM faces in protecting the environment from the effects of surface coal mining. As a basis for comparison, discussion of these regulatory programs is included.

The following discussions are based on interviews with persons in the respective agencies.

5.5.1 Mine Safety and Health Administration

The Mine Safety and Health Administration (MSHA) operates under the Federal Mine Safety and Health Act of 1977 (amending the Federal Coal Mine Health and Safety Act of 1969), which established a federal scheme of regulation that would apply to every mine in every state. This program of federal regulation takes precedence where there is a conflict with state legislation. However, the statute also provides for assistance to states in developing and enforcing effective state programs, even though the federal government would also adhere to and enforce its own program.

Congress set forth in the original 1969 Act a set of interim mandatory health and safety standards that were to remain in force until superseded by "improved mandatory health and safety standards" promulgated by the Secretary of the Interior (under the 1977 Act the Secretary of Labor now has this authority). For the most part, these standards were framed as performance standards for certain equipment and procedures to be followed by the operator. The statute vests the Secretary with discretion in devising permanent standards in the regulations, with the provision that they achieve at least the same level of protection as the statutory standards.

The Act was one of the earliest federal acts dealing with mandatory health and safety standards. Its regulations were written in the light of decades of Bureau of Mines experience with the coal industry, coal mining practices, advanced mining technology, and health and safety problems. This experience, combined with an appreciation of the economic problems and management capabilities of coal mine operators, was found useful in developing appropriate regulations. For coal refuse disposal impoundments a body of data and experience was available to the Bureau of Mines (MESA) through the Bureau of Reclamation (an agency in the Department of the Interior).

The field expertise of Bureau of Mines district managers and inspectors was a source of information drawn upon in drafting regulations under the Act. The legislative standards were drawn after consultation with industry, labor, professional associations, and federal inspectors as to how they should be worded. In certain critical areas, MSHA regulates coal mine health and safety practices by a process requiring the submission of plans for such matters as roof control, ventilation, impoundment structures, and training of mine employees. Roof control and ventilation plans were required by interim mandatory standards in the 1969 Act, while plans for impoundments are required by regulations promulgated after the Buffalo Creek disaster of 1972. Miner health and safety training plans approved by the Secretary of Labor were required by the 1977 Act. The information to be contained in each plan is specified in the regulations. Many of the regulations, such as those for impoundment structures, set only standards of performance. Design is the responsibility of the operator, with final approval authority being exercised by MSHA district managers. The use of performance standards allows MSHA to approve designs that are tailored to site conditions (Kaufman and Williams 1978).

MSHA personnel say that in most cases this approach is satisfactory for several reasons. An operator is involved in the process of plan development, and field inspectors can then take special care in monitoring these activities. In addition, MSHA has the personnel needed to review plans thoroughly and to exercise independent judgment about their adequacy. This is because inspectors have access to technical experts, and are required by statute to have actual mining experience. Inspectors also receive 13 weeks of initial training and 40 hours of retraining each year at the National Mine Health and Safety Academy at Beckley, West Virginia. Inspectors dealing with impoundments receive additional training. MSHA has an adequate number of field inspectors, approximately 1,500, to monitor compliance with the standards. When there are difficulties, MSHA technical experts discuss with operators what is required and how compliance may be achieved. A 1978 study for the Bureau of Mines shows that all essential safety and environmental hazards are covered by this approach (Kaufman and Williams 1978). The MSHA regulatory program has resulted in a substantial increase in worker health and safety, although there are still safety problems inherent in the industry.

MSHA generally finds it possible to interact with operators to achieve compliance with MSHA standards, that is, a minimum acceptable level of safety, without resorting to specific mandatory design criteria. This has been especially true with impoundment structures, and the present regulations are apparently sufficient to minimize any health and safety problems (Kaufman and Williams 1978). For other problems such as roof control, MSHA found it beneficial to set forth in the regulations (30 CFR §75.200-6) criteria by which MSHA district managers are guided in approving plans but that allow the managers to approve other roof control procedures that achieve the same measure of protection.

To assist in assuring that regulations are observed, MSHA is authorized to levy civil penalties and, under certain circumstances, to close mines for violating the regulations.

5.5.2 Environmental Protection Agency

The Resource Conservation and Recovery Act of 1976 (RCRA), as amended in 1978 and 1980, recognizes that the disposal of solid waste had become a problem of "national scope" although its control continues to be a responsibility of state and local governments. Among other objectives, the Act seeks to attain the environmentally safe disposal of solid waste. This includes the regulation of the treatment, storage, transportation, and disposal of hazardous wastes which have, or may have, adverse effects on health and the environment (42 USC §6902).

The RCRA program is still in the early stages of implementation and therefore has little history of achievement, but we use it as an example of how a performance-standard approach could be implemented.

Subtitle C of the Act deals with hazardous waste management, and requires and empowers the EPA Administrator to identify and publicly list hazardous wastes and to set standards applicable to generation and transportation of hazardous wastes and applicable to owners and operators of waste treatment, storage, and disposal facilities. The facilities are then subject to a permitting program whereby their activities can be regulated. The Act authorizes EPA to approve state hazardous waste programs that are equivalent to the federal program. Where a state program has been approved, it operates in lieu of the federal program; this process is similar to achieving state primacy under SMCRA.

EPA's first proposed approach to setting facility standards was to specify in its regulations design standards to be used in the disposal of hazardous wastes and then to delineate areas where disposal would be prohibited on the basis of geologic, topographic, and climatic conditions. However, EPA found it had insufficient data upon which to base design standards and the agency was criticized for being too inflexible. To specify a technology that could be relied on to provide safe disposal for a designated (generally long) period of time would be very expensive and not feasible in some areas. The ideal period of time, in theory, was "forever," but the technical possibility of doing so was in doubt, and costs would be prohibitive. Perpetual maintenance was not considered feasible.

Faced with these problems, EPA has proposed reducing the number of purely design standards by substituting a risk-evaluation procedure that regulators can apply on a case-by-case basis. This procedure does not specify the acceptable level of risk, but requires the regulator to make this judgment on the basis of all the factors involved--location of the disposal site, nature of the hazardous waste, technology of treatment, migration potential, and possible health and environmental impact. The proposal places the burden of proof on the permit applicant to show that the operation would not now or in the future have significant adverse environmental or health effects.

An applicant for a disposal permit is required to submit a plan to the permitting authority, containing the information required by the regulations. Substantively, the applicant is required to show that in the event of leakage the rate, volume, and contamination level of leakage will be sufficiently small that there will be no adverse public health consequences. The importance of this type of regulatory procedure is that, instead of looking to certain technology standards designed to achieve absolute containment forever or for a certain period of years, the permitting authority assumes that some leakage will occur at some point. On the basis of that assumption, the agency then attempts to determine whether the leakage that occurs presents acceptable health and environmental effects.

Because each site needs to be evaluated on an individual basis, EPA has found it desirable for the permitting authority to be at a local (usually state) level, thereby facilitating consultation with local communities. To aid the permit writer, EPA has written a series of documents designed to inform permitting authorities of the characteristics of different substances, techniques of disposal, and related matters. In addition, permit applicants are provided with guidance in preparing permit applications in accordance with latest developments in the state of the art of hazardous waste disposal. EPA hopes this process ensures that the operator is well qualified to prepare and carry out a sound disposal plan and the permitting authority is well qualified to make sound decisions.

5.5.3 U.S. Geological Survey

Since 1926 the Conservation Division of the U.S. Geological Survey (USGS) has been responsible for supervising oil, natural gas, and mining operations authorized under leases on federal lands. With the passage of the Outer Continental Shelf Lands Act of 1953, the USGS was assigned responsibility for assuring safe, pollution-free oil and gas operations on the outer continental shelf. The legal bases for USGS authority are numerous and complex; the administrative procedures that follow from the laws are also varied and complex, but they do not alter the general approach within which the Survey regulates mining and oil and gas operations.

The basic regulations are given in several sections of the Code of Federal Regulations (30 CFR). These are stated in as unambiguous terms as possible, but they are stated as objectives to be met and purposes to be served; the regulations are, in essence, the first level of nationwide supervision. At the second level is the "Order" (or some equivalent step, depending on the law involved and on how this affects the region, or commodity, or activity, or kind of jurisdiction) which interprets the basic regulations for application in the given field. At the third level is the "Notice to Lessees," which is quite specific regarding particular operations.

To obtain a permit for exploration or development, the prospective operator must submit a detailed plan meeting the requirements of all applicable regulations and orders. Approval of the plan by the Conservation Division of the USGS is forthcoming only if the operator's plan demonstrates adequate knowledge of the geologic and engineering conditions to be met, adequate provisions for protecting safety, health, and the environment, and is responsive to all responsibilities required by law.

Specialists in the Conservation Division inspect the operations to assure compliance with the plan, regulations, and orders. Inspectors bring to the task a technical judgment and a sensitivity to the state of the art, to feasibility and practicality, and to the expectations of various interest groups affected by the operations. Noncompliance can result in the closing down of an operation, citations, notices of "incidents of noncompliance," or civil penalties, depending on the circumstances and the particular law or regulations affecting the operation.

The record of U.S. Geological Survey activity on federal lands was available in considering legislation controlling surface coal mining on a federal level; however, this example was not drawn from in enacting SMCRA.

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PART II: ENGINEERING PRACTICES AND ENVIRONMENTAL CONDITIONS

Chapter 6

CHARACTERISTICS OF SPOIL AND SPOIL DISPOSAL AREAS

6.1 INTRODUCTION

In order to discuss excess spoil problems and to pinpoint those regions that have the greatest potential for producing such problems, it is necessary to examine the coal regions of the United States with respect to their geology, physiography, mining methods, hydrology, and climate. Although such a regional overview will not define essential site-specific problems, it will supply a broad framework of environmental characteristics within which to consider special conditions in each area.

The physical properties of spoil materials, and the characteristics of the disposal area, are important in determining the stability of a spoil structure. Because mountain terrain restricts potential disposal sites to heads-of-hollows and valleys and because steep slopes provide a favorable setting for landslides and debris flows, particularly in the humid East, considerable attention will be focused on the characteristics of steep-slope disposal areas.

6.2 AMOUNT, SOURCES, AND TYPES OF EXCESS SPOIL

Spoil is material stripped from the strata overlying the coal bed, the "overburden." The volumetric expansion that takes place when rock is broken and moved, through the creation of voids, is a common source of spoil in all mining methods. At many mines the volumetric increase is greater than the volume of coal removed. Therefore the spoil to be disposed of exceeds the volume of the cut, and the excess spoil must be placed beyond the limits of the cut.

Estimates of the amount of excess spoil generated by the thousands of surface coal mines in the United States are difficult to obtain. Excess spoil disposal is only one part of spoil handling, grading, and revegetation work, and it serves no operational need to keep a separate account of the excess spoil not replaced in mine cuts. No single method or measure (e.g., cubic yards, number of surface mines, and number of acres disturbed) by which to quantify the amount of excess spoil, or the amount anticipated by future mining, would be relevant in all cases. No single measure is significant under all conditions of terrain, geology, climate, and mining method.

Although it is difficult to obtain detailed statistical data on the total number and size of excess spoil disposal areas, some indication of the quantity of excess spoil can be obtained from West Virginia's experience (R. Hall, West Virginia Department of Natural Resources, Reclamation Division, personal communication, 1981). Thirty to forty percent of the permits issued in West Virginia are for mining plans where at least a portion of the spoil is placed away from the mine excavation site. Disposal areas may contain as little as a few thousand to as much as 31 million cubic yards of excess spoil. Most of the excess spoil permits in West Virginia are restricted to steep-slope terrain in the southern part of the state. In the more rolling terrain of northern West Virginia, the disposal of excess spoil is not nearly as critical, because it can be handled in the same way as in strip mining in flat terrain, where only the spoil from the first cut, "the box cut," needs to be disposed of as excess spoil. Spoil from each succeeding cut can be accommodated in the pit excavated in the immediately preceding cut (Figure 6.1). Thus a strip mine may cover several hundred acres, but only the spoil from the first cut remains on the ground to be graded into an acceptable shape (such as a mound or a terrace) and revegetated. The excess spoil in this case may be 5 percent or less of the total amount of spoil handled. When mining is completed, commonly after 10 or more years, the unfilled last cut is usually left as a lake or pond, which often has beneficial agricultural and recreational uses.

Contour mining in steep terrain (Figure 6.2) involves hauling the overburden and depositing most of it on the mined-out bench, with excess spoil disposal placed as head-of-hollow or valley fills. Mountaintop removal is a particular type of contour mining in which the operation proceeds all the way across the top of the mountain (Figure 6.3). The completed mine leaves a flat or gently rolling bench or terrace where the coal seam formerly lay. This method generally requires a large percentage of the material overlying the coal to be moved, or "spoiled," to nearby disposal areas. Such fills can be large structures, accommodating as much as 31 million cubic yards (R. Hall, personal communication, 1981). In areas with steep slopes and narrow valleys, these fills can be quite small in areal extent, but as much as 200-300 ft deep at the maximum fill point.

Surface mining in irregular or rolling terrain or the removal of inclined or multiple coal seams can generate disposal conditions that combine the two types described above. Some spoil may have to be moved off the mining bench to a disposal site, and some may have to be stacked on mined-out parts of the bench or in cuts. In all cases the significant questions are whether the excess spoil has been placed in such a structure and whether the methods used meet the goals of the Surface Mining Control and Reclamation Act (SMCRA), that is, whether the spoil is stable enough to prevent catastrophic failure and whether its configuration and drainage are adequate to protect water supplies and allow revegetation and beneficial land use.

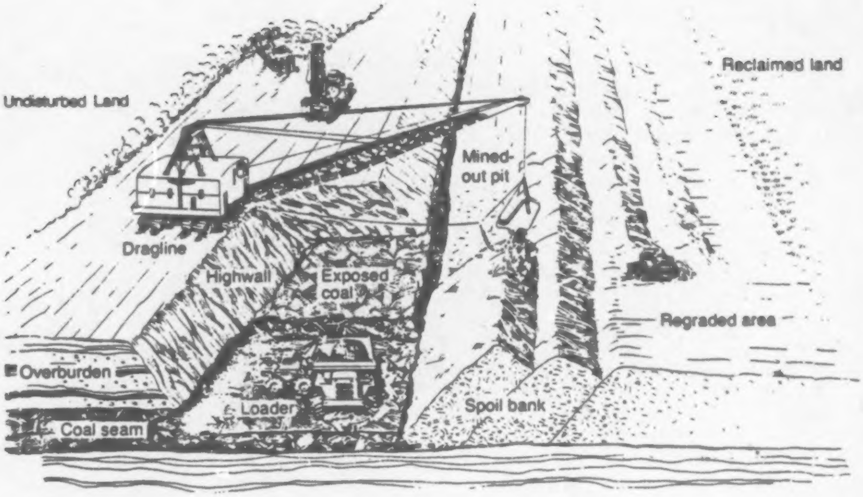
Undisturbed Land
Reclaimed land
Mined-out pit
Dragline
Highwall
Exposed coal
Regraded area
Overburden
Loader
Spoil bank
Coal seam

Figure 6.1 Sketch showing surface mining operation using area mining method.

Source: Leathers (1980).

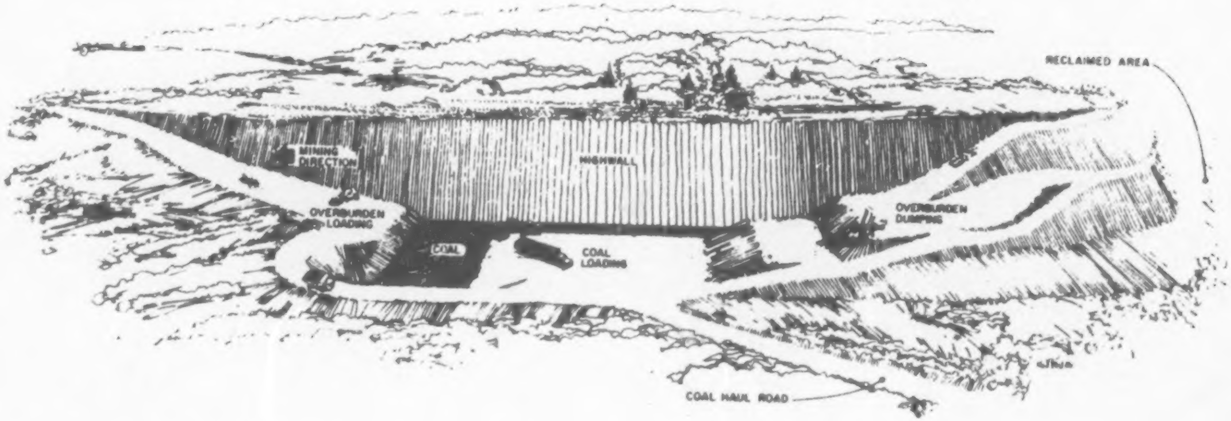
RECLAIMED AREA
MINING DIRECTION
HIGHWALL
OVERBURDEN LOADING
COAL
COAL LOADING
OVERBURDEN DUMPING
COAL HAUL ROAD

Figure 6.2 Sketch showing contour haulback surface mining method.

SOURCE: Office of Surface Mining (U.S. DOI 1980).

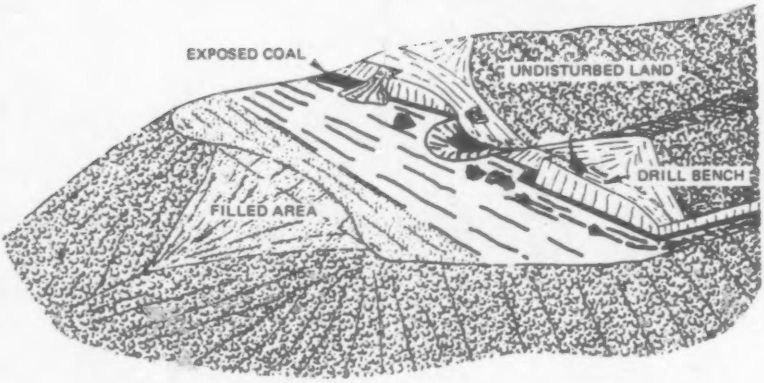
EXPOSED COAL
UNDISTURBED LAND
DRILL BENCH
FILLED AREA

Figure 6.3 Sketch showing surface mining operation using mountaintop removal method.
Source: President's Commission on Coal (1980).

Besides the generation of excess spoil from surface mining in flat terrain and from mining in steep terrain, including mountaintop removal, another general source of excess spoil is also covered by SMCRA: spoil or waste from underground mines that is brought to the surface for disposal. Most of the workings in an underground mine are made in the coal seam and the immediately overlying and underlying rock layers. However, a relatively small volume of waste rock is produced. Coal intermixed with a relatively small amount of waste material can be recovered in a washing plant, and there will be small amounts of waste material rejected at the processing plant (Kaufman and Williams 1978). Ordinarily, a certain amount of waste is used to create flat working areas around the mine openings and to form benches or terraces on which to build shops, offices, warehouses, and related facilities. Excess spoil is thereafter disposed of in banks or fills under the requirements of SMCRA and its regulations.

The cleaning of coal in washing or processing plants removes rock fragments that became mixed with the coal in the mining operation and the sedimentary particles originally deposited with the carbonaceous material that later became the coal seam. The washing reduces the noncombustible ash content and raises the heating value of the coal. The rock material rejected from the washing plant is classified as coal refuse. Commonly, the coarse fraction of the refuse can be dumped into piles or embankments, but the fine fraction must be held in sedimentation ponds to allow clayey material and minute rock and coal particles to settle. In most respects, coal refuse resembles the waste immediately overlying and underlying the coal seam, but it may be different from the bulk of the spoil associated with that coal seam. Obviously, it contains coal fragments not recovered in the washing plant, but in some cases it may also contain a higher percentage of pyrite and other sulfide minerals, metallic ions, and trace elements than the spoil. The chemistry of coals and coal refuse is discussed in the report by the Committee on Accessory Elements (NRC 1979a).

Coal refuse is dealt with differently than excess spoil under SMCRA (§§515(b)(13) and 516(b)(5)) and the OSM regulations (§§816.81-816.93, 817.81, and 817.93). Coal refuse disposal, although related to excess spoil disposal, is not a subject of this report.

In the East the spoil generally consists of sandstone with some shale, claystone, and limestone. Within one mining operation, all rock types or any combination of them could be present. Most of the rocks of the eastern coal fields are Pennsylvanian in age and well consolidated, and hence most overburden has to be drilled and blasted. Shale, claystone, and similar rocks tend to break into relatively small fragments and will eventually break down into fine-grained material through weathering and hydration. Sandstone and some kinds of limestone will generally not exhibit as much fragmentation in blasting as other rock types, and boulder-size material is common. Mechanical handling by power shovels, bulldozers, and haulage by trucks will further reduce the size of the fragments. Thus, depending on the lithologic character of the strata in the overburden, the spoil could range in size from micron-sized particles to boulders.

In the Midwestern Region, shale is the predominant type of rock associated with the coal, but some limestone beds are present. Unconsolidated glacial deposits (sand, silt, and gravel) commonly overlie the bedrock, except in the southern part of the region. Glacial materials are excavated without blasting, and in some mines the digging and moving are handled by bucket wheel excavators and conveyor belts.

In the Western Region, coal occurs in rocks of Cretaceous and Tertiary age. Shale is the common rock type in the overburden, with irregular amounts of sandstone and thin-bedded shaley limestone.

6.3 CHARACTERISTICS OF COAL REGIONS

The major coal fields of the United States can be grouped into three major regions: Eastern (including Appalachia), Midwestern, and Western (Figure 6.4). While it is recognized that each of these regions contains substantial intraregional variation, such a grouping makes an outline of their general characteristics easier because there are broad geologic and climatic similarities within these regions. The physiographic regions of the United States, to which the above coal regions can be related, are shown in Figure 6.5. The geology and the geomorphology are described further in Working Paper III.

The coal fields of the Eastern Region are within the Appalachian Plateaus physiographic province, an area of nearly horizontal strata. This province can be subdivided into three sections on the basis of variations in the bedrock geology, which influences landforms, and the degree of dissection by the drainage.

In the Midwestern Region the coal fields stretch across the boundaries of three physiographic provinces: the Interior Low Plateaus in western Kentucky and southern Indiana and Illinois and the Central Lowland and Great Plains, a vast area predominantly of low relief, with coal fields in central and northern Illinois, Iowa, Missouri, eastern Nebraska, Kansas, Oklahoma, and Texas.

Coal fields of the Western Region (west of the 100th meridian) are scattered from the Canadian to the Mexican borders. The physiographic provinces principally involved are the Great Plains, Rocky Mountains, and Colorado Plateau provinces. Coal deposits also occur in western Washington. The western coal areas differ markedly from each other in diversity of landforms, elevations, and physical characteristics, including a wide range of rock types, geologic history, geomorphology, climate, and vegetation. They differ from coal areas to the east of the 100th meridian in that the coals are distinctive, the precipitation is low except in the high mountains, vegetation is commonly more sparse than in the Midwest and East, and the disposal of excess spoil is generally a minor problem at present.

Mining methods are closely related to physiographic characteristics. In steep-slope Appalachia, surface mining methods include contour mining and mountaintop removal. Head-of-hollow and valley fills are most widely used for the disposal of excess spoil in this area. Area mining as practiced in the flat terrain of the Midwest results in

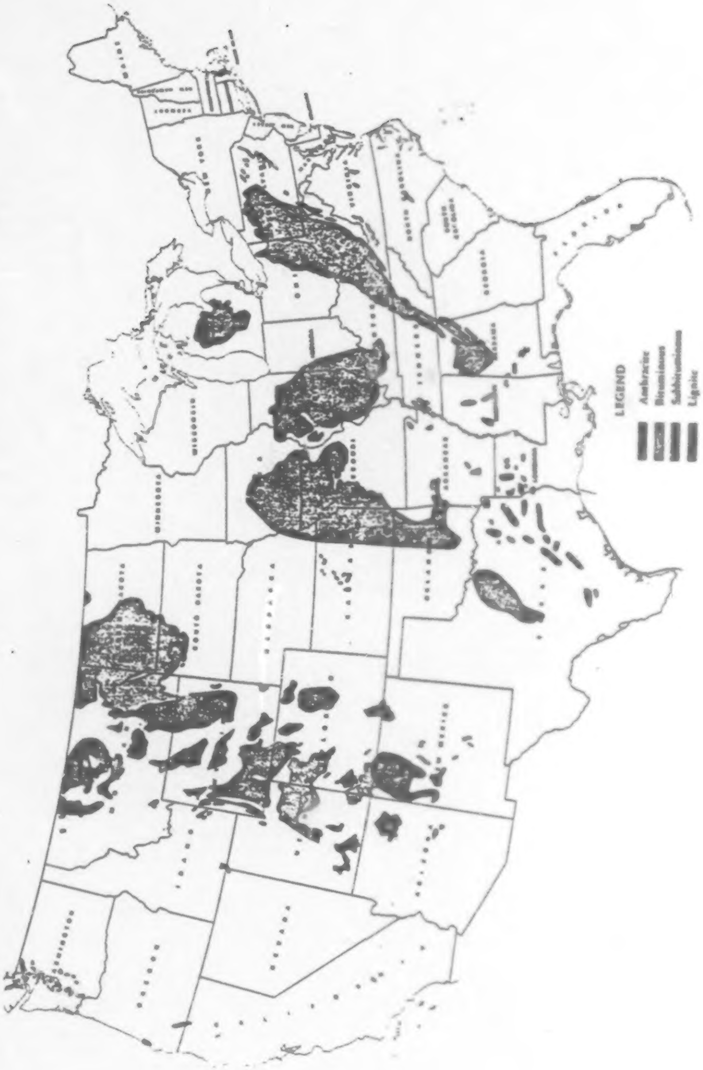
LEGEND
Anthracite
Bituminous
Subbituminous
Lignite

Figure 6.4 Map showing coal fields of the conterminous United States.

Source: U. S. Department of the Interior (1967).

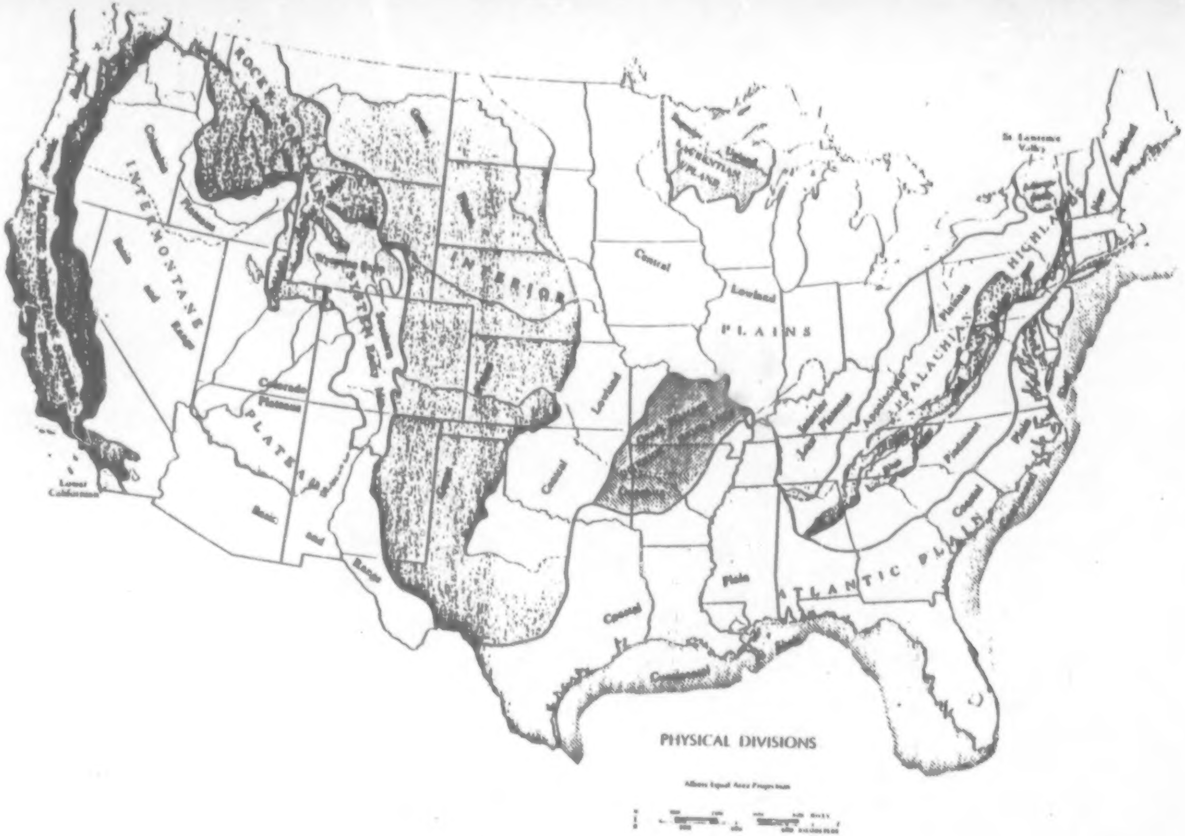
PACIFIC MOUNTAIN SYSTEM
Lower Californian
Columbia Plateaus
INTERMONTANE
Basin and Range
ROCKY MOUNTAIN SYSTEM
Wyoming Basin
Southern Rocky Mountains
Colorado Plateaus
PLATEAUS
Great Plains
INTERIOR PLAINS
Central Lowland
Laurentian Upland
St Lawrence Valley
Appalachian Plateaus
APPALACHIAN HIGHLANDS
Piedmont
Coastal Plain
ATLANTIC PLAIN
PHYSICAL DIVISIONS
Albers Equal Area Projection

Figure 6.5 Map showing physiographic regions of the United States.

Source: U. S. Department of the Interior (1970).

"box-cut" spoil, i.e., a mound on the ground surface adjacent to the first excavation. Operators in the Western Region use the area mining method in flat terrain and in other terrain where coal beds are very thick; some contour mining is done in mountainous areas. Several works describe surface mining methods and the associated waste and excess spoil operations (Pfleider 1972; Cassidy 1973; EPA 1973; Brown 1977; Downs and Stocks 1977; Hoppe 1978; NRC 1979a,b).

Steep-slope Appalachian coal fields commonly have good surface drainage; where slopes are gentler there are some local areas of poor drainage. Surface drainage in the Midwest varies from good to poor, depending on the topography and soil type. The arid West is generally well drained, but there may be local drainage problems in alluvial valleys. Perennial streams predominate in all but the Western Region. Similarly, springs and seeps are common, except in the West. The water table is commonly low in the West, relatively high in the Midwest, and variable in the East.

The Eastern Coal Region has a humid continental climate, with prevailing westerly winds, and frequent fluctuations in weather. Summer thunderstorms may cause flooding, and large-scale winter frontal storms also cause flooding in the Appalachian foothills (Alabama) and Cumberland Plateau (Tennessee).

The Midwestern Region is also characterized by a continental climate. Floods, thunderstorms, and tornadoes are common. Winter snowstorms are commonly accompanied by heavy winds.

An arid to semiarid climate prevails in most of the Western Region. Windy conditions create winter blizzards and spring duststorms. Thunderstorms cause most of the flooding, but some floods are caused by spring melting of the snowpack. Flash floods result from the concentration of precipitation from severe thunderstorms in small drainage basins. (The general climatic character of the coal regions of the conterminous United States is discussed further in Working Paper III.)

Table 6.1 summarizes some of the important characteristics of the coal regions of the conterminous United States. The coal basins are grouped into broad areas, each having geologic, physiographic, hydrologic, and climatic factors in common. The areas are by no means homogeneous with respect to these characteristics; indeed, even individual sites will have variations in conditions.

The following generalizations are drawn from an examination of Table 6.1, although it is recognized that the intraregional differences are substantial:

- Excess spoil is common in Appalachia and could become so in Rocky Mountain areas because of steep slopes, the generally high ratio of overburden to coal, and inadequate room for spoil on the mine bench.
- Potential problems (e.g., slope failure and slides) are more prevalent in Appalachia and Rocky Mountain areas because of steep slopes, high rainfall and snowfall, springs and seeps in the disposal area, and the potential for high-storm-runoff volumes.
- Minor or insignificant problems occur with excess spoil in the Midwest and in gently rolling to flat areas of the West because of flat

TABLE 6.1 Geologic, Physiographic, Mining, Hydrologic, and Climatic Conditions in the Eastern (Appalachian), Midwestern, and Western Coal Regions

FACTOR	APPALACHIA		MID-WEST	WEST
	Predominantly Steep Slope	Predominantly Gentle Slope		
AREA INCLUDED	Virginia, Southern West Virginia, Eastern Kentucky	Northern West Virginia, Ohio, Pennsylvania, Maryland, Tennessee, Alabama	Illinois, Indiana, Western Kentucky, Iowa, Missouri, Kansas, Oklahoma (Lignite in Texas and Louisiana)	Arizona, New Mexico, Colorado, Wyoming, Montana, Utah (most exploited coal is in gentle slope terrain but some steep slope mining)
GEOLOGY & PHYSIOGRAPHY Geologic age of coal	Principally Pennsylvanian age	Principally Pennsylvanian age	Principally Pennsylvanian age	Principally Cretaceous and Tertiary age
Physiographic Province[1]	Appalachian Plateau	Appalachian Plateau	Central lowland, Interior low plateau, Ozark Plateau	Great Plains, Colorado Plateau, Rocky Mts. System
Terrain	Steep Slope, mountain terrain	Mostly gentle slope with minor steep slopes	Relatively flat	Major areas presently exploited are relatively flat, coal does occur in steep slope mountain terrain also
Rank of coal	High volatile and low volatile bituminous	High volatile bituminous to anthracite	High volatile bituminous	Mostly sub-bituminous and lignite but some mining in all ranks from anthracite to lignite
Thickness of coal	Thin seams predominate (18" to 60")	Thin seams predominate (18" to 72")	Thin seams predominate (18" to 96")	Thick seams important; wide range (4' to 100')
Overburden/coal ratio	Generally high[2] up to 60/1	Generally high[2] up to 60/1	Generally moderate[2] to high up to 60/1	Generally low[2] < 1/1 to 5/1
Number of seams	Multiple seam mining common	Multiple seam mining common	Commonly one seam mining	Multiple seam mining not common except in deep strip mining
Relative sulfur content	Moderate to low < 1% to 4%[3]	Moderate to low < 1% to 4%[3]	Relatively high sulfur 2% to 6%[3]	Relatively low sulfur generally 1.5%[3]
Structure	Relatively flat lying <5°	Flat to moderately inclined <10°	Flat lying - dips generally <1°	Major exploited areas (sub-bituminous and lignite) are relatively flat, mtn areas commonly inclined

TABLE 6.1 (Continued)

FACTOR	APPALACHIA		MID-WEST	WEST
	Predominantly Steep Slope	Predominantly Gentle Slope		
Natural (pre-mining) slope structure	Landslides (ancient and modern) common	Landslides (ancient and modern) not prevalent	Landslides rare	Landslides rare except for steep slope Rocky Mountain areas
MINING Type of surface mining	Contour mining and mtn top removal	Contour mining	Area mining	Area mining and deep pits in thick coals. Some contour mining in mountains
Excess Spoil	Necessary to identify disposal areas for excess spoil	Disposal of excess spoil generally not necessary except first cut spoil	Disposal of excess spoil generally not a problem except for first box cut	Disposal of excess spoil generally not a problem except possibly in mountain terrain
Application of mountain top mining	Promising in some areas	Not common but possible in some areas	Conditions favoring are rare	Not common - but cannot be ruled out for local areas
Head of hollow and valley fill	Most widely applied in this area	Less common but not unknown	Not common	Not common in gentle terrain, more common in mountain terrain
Box-cut excess spoil	Not applicable	Applicable in plateau regions	Most widely applied in this area	Less widely applied than in Mid-west
HYDROLOGY AND HYDROGEOLOGY Surface mining in relation to drainage	Commonly above	Commonly above	Commonly below	In non-mountain terrain, coal under alluvial valleys may be a special problem
Surface drainage	Commonly well drained	Commonly well drained locally poorly drained	Well drained to poorly drained	Well drained and semi-arid conditions in general - may have local drainage problems in alluvial valleys
Importance of perennial streams	Predominate	Predominate	Predominate	Uncommon
Acid mine drainage	Moderate - high potential	High potential	Relatively low potential except for certain seams	Medium potential in mtn areas, low potential in gentle slope terrain

TABLE 6.1 (Continued)

FACTOR	APPALACHIA		MID-WEST	WEST
	Predominantly Steep Slope	Predominantly Gentle Slope		
Alkali-Sodic Spoil	Relatively low potential	Relatively low potential	Relatively low potential	High potential for select coal stratigraphy
Presence of springs and seeps	Fairly common	Fairly common	Occur but not common as potential problems	Not common, but may be problem where they occur
Groundwater hydrology water table	Variable, perched water table common	Variable, perched water table common	Relatively high	Commonly low
Predominant type of aquifers	Naturally fractured rock	Naturally fractured rock	Unconsolidated materials and naturally fractured rock	Unconsolidated materials important especially in alluvial valleys, fractured rock in mtn areas
Effect of mining on aquifers	Local aquifers may be disturbed but not a major regional problem	Local aquifers may be disturbed but not a major regional problem	Local aquifers may be disturbed but not a major regional problem	Not generally a major problem but could have locally significant impact, major potential problems in alluvial valleys
CLIMATE Mean temperature (°F) January July	 30 - 35 70 - 75	 28 - 35 68 - 75	 30 - 38 70 - 78	 20 - 30 65 - 75
Average annual precipitation	40 - 50"	35 - 45"	35 - 50"	10 - 30"
Snow fall	<16 - 35"	20 - 40"	10 - 20"	20 - 60"
Typical storm volume Frequency-Duration 10 years - 24 hours 25 years - 24 hours 100 years - 24 hours	 5" 5" 6 - 7"	 3½ - 4" 4½" 5 - 5½"	 4½ - 5" 5½" 6½ - 7"	 2½" 2 - 3" 2 - 4"
Probable maximum precipitation event	50"	47"	49"	12"

1/ Based on classification of Fenneman (1928).

2/ Figures need to be verified

3/ Averaged from state data in Keystone Coal Industry manual (McGraw-Hill 1980) terrain, low stripping ratios (thick coal seams), flat-lying coal, area or open-pit mining, and few springs and seeps.

6.3.1 Site-Specific Characteristics

Although examination of the general characteristics of a coal region may give sufficient information to identify broad potential problems associated with excess spoil disposal, detailed information is needed to plan and operate a mine. Thus knowledge of the geology and characteristics of materials at a mining site from which excess spoil will be taken and of the site where excess spoil will be disposed of is essential to planning disposal and reclamation in an environmentally acceptable manner. With a few exceptions, the information on geology and character of materials needed for mining and reclamation planning is similar to that needed for excess spoil disposal. Hydrologic and hydrogeologic data are required for all areas involved (see Section 4.2.1).

The information indicated in Table 6.2 to be obtained and the comments that follow are generalizations broadly applicable to the three major coal-producing regions of the country, but as was noted above each region has distinctive characteristics, with significant variations within each province and even considerable variation within a single mine site. Much of the detailed data suggested in Table 6.2 is already available for use in planning excess spoil disposal regulations, through the work of agronomists, soil scientists, geologists, engineers, and biologists.

In a premining assessment conducted to plan the disposal of excess spoil, it is important to do the following:

1. Determine the basic geology and hydrology of the mine and the disposal site.
2. Determine the quantity and quality of soil-forming materials.
3. Identify potential problem strata, for which special methods of disposal must be considered.
4. Identify strata whose disposal does not constitute a problem but that might (1) supplement soil (especially where the natural soil layer is thin), (2) improve the properties of reclaimed soil, and (3) have layers with properties that might be useful for special purposes (such as construction of drainage ways).

In Table 6.2 and in accompanying paragraphs, three categories of basic information are indicated for each of the three major coal regions. These are the data generally needed, the data needed on a site-specific basis, and the data occasionally or rarely needed or very site specific. The parameters listed in Table 6.2 regarding geology and characterization of materials suggest the type of data needed, but is not intended to be all-inclusive, although most factors are listed. The categorization of the level of need for each type of data is, at best, approximate. On a site-specific basis, those data required to obtain a permit are in addition to those required of the operator to

TABLE 6.2 Information Needed for Planning and Managing the Disposal of Excess Spoil

Geology (Physical Properties)	Soils			Unconsolidated Surficial (Exclusive of Soils)			Bedrock			Excess Spoil		
	Appalachians	Interior	Western	Appalachians	Interior	Western	Appalachians	Interior	Western	Appalachians	Interior	Western
Stratigraphy (layering in spoil)	X	X	X	X	X	X	X	X	X	X	X	X
Geologic Structure	—	—	—	O^1	O^1	O^1	X	X	X	—	—	—
Lithology (incl. spoil layers)	—	—	—	—	—	—	X	X	X	X^2	X^2	X^2
Aquifers (Identification-Description)	—	—	—	X	X	X	X	X	X	X	X	X
Springs (Location & description)	—	—	—	X	X	X	X	X	X	X	X	X
Thickness of Units (incl. spoil layers)	X	X	X	X	X	X	X	X	X	O	O	O
Texture	X	X	X	X	X	X	X	X	X	X	X	X
Grain Size (% sand, silt & clay) (particle size in spoil)	X	X	X	X	X	X	X	X	X	X	X	X
Weathering (thickness)	—	—	—	X	X	X	X	X	X	—	—	—
Weathering Potential	—	—	—	X	X	X	X	X	X	X	X	X
Mineralogy	—	—	—	X	X	X	X	X	X	—	—	—
Clay Mineralogy	X	X	X	X	X	X	X	X	X	X	X	X
Slaking Character	—	—	—	—	—	—	X	X	X	X	X	X
Soil Dispersion Test	—	—	X									
Density	X	X	X	X	X	X	X	X	X	X	X	X
Rock Soundness (more durable layers)	—	—	—	—	—	—	X^3	X	X	X^3	X	O
Quality	—	—	—	—	—	—	X^3	X	X	X^3	X	O
Broken size distribution	—	—	—	—	—	—	X^3	X	X	X^3	X	O
Unconsolidated Material Strength	O	O	O	X	X	X	—	—	—	—	—	—
Plasticity (Atterberg Limits)	O	O	O	X	X	X	O	O	O	—	—	—
Moisture Content (field and laboratory	X	X	X	X	X	X	O	O	O	X	X	X
Optimum Moisture/Density Relationship	X	X	X	X	X	X	—	—	—	X	X	X
Permeability	X	X	X	X	X	X	O	O	O	X	X	X
Shrink swell potential (field and laboratory)	O	O	O	X	X	X	—	—	—	X	X	X
Soil Classification (USDA)	X	X	X	—	—	—	—	—	—	—	—	—

TABLE 6.2 (Continued)

Chemistry	Soils			Unconsolidated Surficial (Exclusive of Soils)			Bedrock			Excess Spoil		
	Appalachians	Interior	Western	Appalachians	Interior	Western	Appalachians	Interior	Western	Appalachians	Interior	Western
Soil Rock Analyses												
P, K	X	S	X	X	S	S	S	X	S	S	S	S
Ca, Mg, Na, NO_3-N	X	S	S	S	S	S	S	X	S	S	S	S
Fe, Cu, Mn, Zn, Al	S	S	S	X	S	S	S	X	S	S	S	S
Se, B, Mo, As	X	S	S	S	S	S	S	S	S	O	O	O
Cd, Pb, Hg	S	S	S	S	S	S	S	S	S	S	S	X
Other trace and minor elements	O	O	O	O	O	O	O	O	O	S	S	S
Total Sulfur (Quantity & distribution)	S	S	S	S	S	S	X	X	X	X	X	X
Sulfate Sulfur	X	O	O	O	O	X	S	S	S	O	O	X
pH	X	S	X	X	S	X	O	O	O	X	X	X
Electrical Conductivity--Salinity	X	O	O	S	X	X	S	S	X	S	S	S
Cation Exchange Capacity	S	S	S	X	S	X	O	O	S	S	S	S
Sodium Adsorption Rates and/or Exchangeable Sodium Percentage	S	S	S	S	S	S	O	O	X	X	X	X
Total Carbonate (quantity and distribution)	S	S	S	S	S	S	X	X	X	X	X	S
Organic Content (soils)	X	X	X	S[4]	S	X[4]	—	—	—	—	—	—
Neutralization Potential	S	S	S	S	S	S	S	S	X	X	X	X
Ground-Water Quality							X	X	X	X	X	X
pH	—	—	—	X	X	X	X	S	S	S	S	X
Salinity	—	—	—	X	X	X	S	S	X	X	S	S
Total Dissolved Solids (TDS)	—	—	—	S	S	X	S	S	X	S	S	S
Total Suspended Solids	—	—	—	O	O	S	S	S	S	O	O	O
Hardness ($CaCO_3$ content)	—	—	—	S	S	S	S	S	S	S	S	S
Field Temperature	—	—	—	O	O	O	O	O	O	O	O	O
Chemical Analyses	—	—	—	S	S	S	S	S	S	S	S	S

Key:

X Data considered to be necessary at most sites to provide information required for permits.

S Data which are considered as "selectively" required depending on site specific character or special reclamation requirements. Selective designation is also indicated where a few determinations may seem appropriate to evaluate the order of magnitude of a given parameter.

O Data considered desirable occasionally because of special site specific conditions.

— Test not generally required.

Notes:

1. At some sites, observation of slump, landslides, etc., in unconsolidated surficial material would be important, particularly on excess spoil disposal site.
2. Notation of significant differences in excess spoil layers or lifts may be important.
3. If underdrains or rock chimneys are required, this characterization is essential. Elsewhere it may be important to assure that durable materials are sufficiently buried that they do not interfere with surficial reclamation.
4. If an operator wishes to demonstrate that topsoil alternatives exist, the Interim Regulations of OSM require organic content determinations.

carry out his reclamation plan. The details of the approved plan for the reclamation of an excess spoil disposal site will significantly alter the parameters that need to be considered. Standard or approved methods of assessment should be employed for each parameter for which data are generated.

Determination of the properties of overburden, spoil, and areas where spoil is to be placed will be essential to the geotechnical engineer's design of a safe and stable spoil structure.

6.3.1.1 Relevant Physical Properties As is noted in Table 6.2, certain properties of spoil are more germane to the problems of disposal of excess spoil than others. These properties are especially relevant to the engineering problems that are of primary concern to this study: placement of excess spoil in head-of-hollow fills, valley fills, durable rock fills, as well as cross-valley fills, and side-hill fills. Of secondary interest are dams constructed from coal-refuse to impound slurry wastes from coal-processing plants; this coal refuse is not classed as excess spoil, but its properties are important, because its disposal is associated with the construction of impoundment structures.

A number of physical properties of excess spoil are relevant to the design of non-water-impounding fills and to the associated environmental impacts. These properties include size distribution, permeability, relative density, void ratio, and tendencies to crush, to weather, and to slake. For example, relative density, which measures the degree to which the spoil has been compacted, is a critical factor in considerations of the behavior of an earth structure, and particle size distribution is important to drainage and to water and air pollution (see Chapters 7 and 8).

It is well known in soil mechanics that ground stability depends on the geometry of a mass of spoil, the pore-water pressure distribution within the spoil, and the physical properties of the spoil. The geometry includes the shape of the surface of the spoil, the pattern of layers or lenses of spoil and the underlying soil, and the shape of the interface between solid bedrock and the spoil deposited on it. The engineering properties of spoil generally considered to be important in stability analyses are discussed in Section 8.2.3. The data on physical properties discussed here are useful as guides to how spoil behaves after placement, including the overall stability of the structure.

It should be emphasized that there is no single measurement of physical properties that will predict accurately landslide potential or the postlandslide behavior of excess spoil structures. While measurements of physical properties are necessary, they are not sufficient for such predictions. Each type of spoil, just like each type of soil, has its own characteristics, which must be known for engineering purposes.

In many landslides the seat of the sliding is at the unconsolidated bedrock interface with the spoil fill. In such circumstances the properties of the spoil may be of secondary importance to those of the natural soil or rock. Two of many examples are the Fort Peck slide and flow in Montana (a slide in a hydraulic-fill dam (Casagrande (1965)), and the Aberfan slide and flow in Wales (Bishop 1973; Working Paper I). In both cases, the seat of initial sliding apparently was beneath the man-made fills; for the Fort Peck slide the seat of movement was weathered shale, and for Aberfan it was weathered till. The properties of the fills themselves became important only after flows developed from the initial sliding. If sliding had been prevented, the flows would not have occurred.

Another example of landsliding, which resulted in destructive flooding, occurred in a dam containing slurry tailings at Buffalo Creek in West Virginia. Coal mine spoil and coal-processing waste used to construct the dam apparently were placed on a foundation of slurry tailings impounded behind a dam farther downstream, and the failure began in the relatively soft tailings beneath the spoil used to construct that dam (Schlick and Wahler 1976, p. 17; Working Paper I).

Although the preliminary design of a spoil structure can be carried out on the basis of the general characteristics of the spoil, the final design must be based on specific properties of the spoil as well as the material forming the foundation of the spoil. Adequate field and laboratory investigations must be made at the site on which the structure will be built. In some areas, particularly parts of the Eastern Region, natural landsliding is common, and the existence of ancient landslides and the potential for future landslides in or adjacent to spoil disposal sites must be considered in evaluating foundation conditions (see Section 7.5).

It should be noted that the slope failures described here have occurred in large structures (e.g., Aberfan, Buffalo Creek) that were not composed of excess spoil materials (see Section 7.5.1.5 and Working Paper I). We do not mean to imply by the use of these examples that there is the same potential for failure in excess spoil piles associated with coal mining. Despite numerous requests for information, the Committee has not learned of any serious failures in the United States from pre-SMCRA or post-SMCRA excess coal mining spoil disposal structures (see Section 7.5.3.1).

6.3.1.2 Geomorphic Conditions In order to ensure the long-term stability of excess spoil disposal sites, it is necessary to consider not only the geomorphic setting of the site and the effects of climate, vegetation, and geology (see Working Paper III) but also to evaluate the site with regard to its position within the drainage system (Schumm 1977). Excess spoil should be placed where it will not be significantly affected by natural channel erosion or by upstream and downstream changes that could affect channel and slope stability at the site.

Upstream changes in vegetation as a result of forest fires or changing land use can severely alter the hydrologic and geomorphic character of the stream, thus rendering a disposal site less suitable than it had been before these changes. For example, upstream dam construction or soil conservation programs may decrease sediment yields so much that downstream channels will erode or deepen. This channel incision may also cause the slopes adjacent to the channel to become unstable.

Where streams are not confined by bedrock, the natural shifting of the channel through time can pose a significant hazard to spoil-pile stability.

Care should be taken to evaluate conditions downstream from the spoil site and the potential for downstream channel modification. If the channel is not controlled by bedrock, downstream lowering or steepening of the channel will lead to upstream migration of nickpoints and degradation at the site. The potential for such changes can be evaluated by examination of aerial photographs. Comparison of the earliest with the most recent photographs often provides a clear indication of potential land form changes.

Each disposal site is geomorphically unique and should be evaluated with regard to its recent geomorphic history, morphologic character, and relative stability. Geomorphic changes that could affect a disposal site and possible causes of these changes are shown in Table 6.3. These causes are grouped according to location as on-site, upstream, and downstream controls. Obviously, if the spoil is located on a drainage divide or if it is a head-of-hollow fill, geomorphic changes will not be significant.

Four principal geomorphic changes need to be considered: channel erosion, channel deposition, bank erosion, and slope movement (instability). Channel erosion is degradation or channel deepening; channel deposition is aggradation or channel filling. Bank erosion includes meander growth, meander shift, local bank erosion, and floodplain destruction. Slope instability results from erosion by rilling and gullying and from mass movement. Note that bank erosion as well as slope instability may result from all of the causes listed in Table 6.3. Bank erosion will accompany both channel erosion and channel deposition, and bank erosion and channel shift may trigger slope failure in the form of landsliding or surficial erosion. This applies both to spoil piles and to the natural slopes of valley sides. When there is channel incision or bank erosion near the base of a slope, there is a possibility of slope instability.

Time, as used in the table, simply relates to the slow natural processes of erosion without any change of the other controls. With the passage of time, channels will shift laterally as meanders grow and shift. This natural and expected channel behavior will cause bank erosion, and it may cause slope failure on site and elsewhere if the toe of the slope is removed by the stream.

Earthquakes can cause bank failure and erosion and slope instability on site. The added sediment load from on site and from upstream may cause channel deposition.

Removal of bank vegetation on site will lead to bank erosion. The various types of channel modification, which are aimed at developing a more efficient channel, will normally cause channel deepening and bank erosion unless a noneroding channel perimeter is provided.

Upstream hydrologic changes may be the result of upstream changes in land use, forest fires, or any other factor that alters sediment or water yields. For example, timbering operations will increase runoff, flood peaks, sediment yields, and debris production. Dam construction will probably decrease runoff, flood peaks, and sediment yields. All

TABLE 6.3 Geomorphic Changes of Possible Significance to Spoil Disposal Sites

Cause	Geomorphic Changes			
	Channel Erosion	Channel Deposition	Bank Erosion	Slope Movement (instability)
On site				
Time (natural change)			X	X
Earthquakes		X	X	X
Removal of bank vegetation			X	X
Channel modification (constriction, alignment, channelization)	X		X	X
Upstream				
Increased runoff	X		X	X
Decreased runoff		X	X	X
Increased peak discharge	X		X	X
Decreased peak discharge		X	X	X
Increased sediment yield		X	X	X
Decreased sediment yield	X		X	X
Downstream				
Baselevel lowering	X		X	X
Baselevel raising		X	X	X

SOURCE: Modified from Shen et al. (1981).

of these changes can significantly affect conditions at a downstream disposal site, with the resulting geomorphic changes as indicated in Table 6.3.

Downstream base-level changes can occur as a result of reservoir or lake level declines, dredging, gravel mining, or channelization. These downstream changes may produce channel incision and perhaps rejuvenation of the upstream drainage area. Dam construction and the raising of water levels in lakes and reservoirs will induce aggradation that may influence upstream sites by causing channel widening and bank erosion.

6.3.1.3 Erosion and Mass Wasting--Influence of Physiography, Climate, and Hydrology Steep slopes, deep valleys, and high precipitation rates characterize large parts of the Eastern Coal Region. Erosion of excess spoil structures can be controlled by intereceptor drains and channels, proper shaping, providing for drainage, and the stabilization of surfaces by vegetation to lessen erosion by surface runoff and raindrop impact. The spoil has a potential for mass wasting, just as the natural valley slopes have. Mass wasting in the Midwestern Region is generally of much less concern than it is in the Eastern Region.

The major problems in the West are the rehabilitation of dry lands and the establishment of vegetation, the reestablishment of ground-water systems, and the reclamation of stream channels. Reclamation in a semiarid climate must contend with maximum, not minimum, erosion potentials. These relationships are discussed in Working Paper III.

There are relatively few areas where steep slopes, overall topographic relief, and hydrology combine to create a potential hazard. Of greater concern is the establishment of reclaimed areas either similar to the original topography or shaped to a benefical use that is compatible with but in some ways different from the original topography.

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Chapter 7

ENVIRONMENTAL IMPACTS OF EXCESS SPOIL DISPOSAL

Most of the available data on the environmental impacts resulting from coal mining and excess spoil disposal were collected prior to the enactment of the Surface Mining Control and Reclamation Act (SMCRA) in 1977. Since then, the disposal of excess spoil has undergone drastic changes, and it is unlikely that the prelaw data, many of which were required by state laws and regulations, are applicable to postlaw conditions. Since the Office of Surface Mining (OSM) program was not implemented until 1978, the number of data directly related to present methods of excess spoil disposal is relatively small and geographically restricted; therefore much of the following material is based on the available data base, although that base may be deficient in certain areas.

7.1 WATER POLLUTION

7.1.1 Infiltration

Infiltration refers to the movement of water through the soil surface into the ground. Because surface runoff from spoil embankments is usually greater than runoff from undisturbed lands, it appears that there are lower rates of infiltration into spoil embankments than into undisturbed lands (Curtis 1977). However, broad statements about spoil-bank infiltration rates cannot be made with confidence, because a wide variety of factors influence the rates (Coleman 1951). The spatial and temporal variations in measured infiltration rates range over 2 or 3 orders of magnitude, and there is the additional complication that the measurements are affected by the equipment used to make them. The permeability of subsurface spoil, expressed as saturated and unsaturated hydraulic conductivity, also has a strong influence on infiltration rates. Generally, saturated hydraulic conductivity values are lower than surface infiltration rates, and they often control the rate of water entry into the spoil (Jeppson and Farmer 1980). Finally, Hawkins (1981) has demonstrated that when infiltration rates are measured with sprinkling infiltrometers, the "apparent" infiltration rate will not reflect the true infiltration rate unless the rate of water application exceeds the true infiltration rate. Spoil-bank infiltration rates are also influenced by vegetal cover characteristics, the source of water (whether rain or snowmelt), water temperature, soil structure and organic matter, and, finally, the antecedent water content of the spoil (Curtis 1979).

Infiltration is conceptually simple, but it is difficult to measure in the field. The concept is of limited usefulness in assessing the reclamation of mined land.

7.1.2 Surface Runoff

Surface runoff is a major component of streamflow, especially in the humid eastern United States. In the western United States, surface runoff is a smaller component of streamflow, except in the case of cloudburst precipitation or in certain cases of rapid snowmelt.

The quality of surface runoff is strongly influenced by the mineral and chemical composition of the upper layers of a spoil bank. In the case of acid spoil, the adverse influence on the chemical quality of runoff can be severe. If spoil erosion continually exposes unoxidized sulfide minerals, the problems are exacerbated and will persist over long periods (Ohio State University Research Foundation 1971, Farmer et al. 1976).

Even in the case of nonacid spoil embankments, freshly exposed material is subject to rapid chemical breakdown due to weathering. In Breathitt County, Kentucky, Curtis (1972) found increases in sulfate, calcium, magnesium, aluminum, manganese, iron, and zinc in streamflow coming from coal mining areas in six small watersheds. In a follow-up study of the same area, Dyer and Curtis (1977) found that these chemical constituents of streamflow reach a maximum after mining has ceased, and then hold steady for several years. The concentration of dissolved salts is greatest during low-flow periods, whereas the greatest quantity of dissolved material is carried during the period of highest flow.

Adverse water quality conditions, such as those cited above, are expected to continue. The OSM regulations governing surface-water drainage, revegetation, and topsoiling are expected to reduce the volumes of runoff from excess spoil embankments. However, reduced volumes of runoff may not reduce the total chemical loading in adjacent streams if the increased volume of water stored in the spoil dump ultimately appears as stream base flow.

7.1.3 Ground Water

The quality of ground-water systems is also influenced by the mineralogy and chemistry of spoil banks, because water percolating through spoil banks reaches ground-water systems underlying the area (Fischer 1976). These percolating waters carry soluble compounds (including inorganic fertilizers) into aquifers. The contribution of this leachate to ground-water pollution is influenced by several factors, notably the geochemistry of the aquifer.

The regulations for excess spoil disposal prohibit coal-processing wastes or acid- or toxic-forming materials in head-of-hollow or valley fills. Still, leaching of excess spoil materials could contaminate ground water over time, especially if the spoil contains leachable sulfide minerals such as pyrite. New methods of treating spoil piles to prevent such leaching could possibly be investigated, utilizing the knowledge and technology that are being developed in connection with the leaching of dumps of low-grade ore to extract metal values, but here the reverse process would be required. New research is needed in this area (see Appendix B).

For the most part, pollution of ground-water systems is irreversible and tends to get worse because of the long residence times for water within the system. The OSM regulations governing excess spoil disposal are not expected to change this situation.

Research to monitor the chemical pollution of runoff water originating in excess spoil embankments is needed (see Appendix B). This work should cover conditions prior to, during, and for several years after construction. The relationship of different types of vegetal cover to the runoff from post-SMCRA excess spoil embankments should be examined.

Environmental performance standards for runoff should be based on the quality of the receiving, surface-water system. However, in cases where the receiving system is badly affected by acid mine drainage or other upstream industrial effluents, stricter standards may be appropriate when overall regional conditions are considered (see Section 4.2.1.).

7.2 IMPACT ON AIR QUALITY

7.2.1 Introduction

Air quality in mining areas has not been a subject of great concern, and no agency has a legislative mandate to study this subject in depth. As a result, there is little literature on the air quality impacts of the different activities conducted to extract coal and other minerals. This discussion outlines the general nature of the subject and identifies the aspects that need to be studied.

The disposal of excess spoil affects air quality directly, when waste particles are thrown into the air, and indirectly, when the disposal process injects material, such as the exhaust gases from diesel motors, into the atmosphere. The health effects depend on reactions of the pollutants in the atmosphere, the inhalation of pollutants into the deepest parts of the lung, and their chemical reactions with the cells lining the respiratory tract. The environmental effects of the air pollutants include the deterioration of visibility and the effects on vegetation and wildlife. These health and environmental effects depend on spoil particle size, chemical composition of the spoil, and combustion products produced by mining equipment.

Local wind velocities and moisture content of spoil account for some of the differences in the impact of excess spoil disposal on air quality in the three mining regions of the United States. Alternative methods of disposal may have different effects on the direct generation of dust and the indirect emission of pollutants. Alternative methods need to be compared in terms of overall impacts on air quality resulting from excavating, loading, hauling, dumping, and spreading the spoil. After spoil is moved to its disposal site, the emission rate depends on wind conditions, soil moisture, and degree of reclamation.

7.2.2 Placement of Excess Spoil

Assessments of the impact on air quality may be based on local conditions or regional considerations. A diesel-powered shovel generates dust and combustion products at a mine, whereas an electric-powered shovel generates only dust. At distant, coal-fired power plants, however, pollutants are emitted in producing electricity for the electric-powered shovel. The assessment needs to compare efficiency in pollution control and tolerance to the impacts on air quality at each locality.

Vehicles for transporting spoil inject particles directly into the air and create air turbulence which entrains additional dust. The effects are magnified as the speed of the vehicle increases. The velocity and turbulence of the natural air flow also affect the rate of particle emission and its dispersion. The total amount emitted will depend on the distance from loading point to disposal site. The emission of combustion products depends on the choice of transport machine. The commonest spoil haulage vehicle is the heavy truck, and most heavy trucks use diesel fuel. In most surface mining in flat terrain, the spoil is stacked by shovel or dragline in an adjacent mined-out cut, and only the excess spoil (usually from the first cut) needs to be hauled to a disposal site.

In regions of steep-slope coal mining, placement of spoil in a disposal structure may be accomplished by end-dumping off the mining bench or the perimeter of the fill area, or by hauling the spoil down to the fill structure. End-dumping usually requires trucks to travel a shorter distance, but it may create much dust as the spoil cascades down the slope. Dumping at the toe of the fill or on the fill surface requires the spoil to be transported over a longer distance, generating dust on the haul roads, although the dumping and spreading process creates less dust. The trade-off in emissions of spoil particles and combustion pollutants are difficult to analyze, because different pollutants affect human health and welfare in different ways and the variables are to a large degree specific to each site.

7.2.3 Storage of Excess Spoil

Excess spoil is stored in the final cut of some strip mines, above ground next to the first cut in other strip mines, and in disposal structures filling valleys and hollows. The emission of spoil particles into the atmosphere depends on the exposure of spoil to local winds, the magnitude and gustiness of these winds, and the local water cycle. The water cycle (the amount, frequency and kind of precipitation, evaporation and runoff, and the resulting moisture content of the spoil), spoil texture and mineral composition, chemistry, and management activity determine how much excess spoil is injected into the atmosphere by the wind. Revegetation is one method of reducing air emissions from excess spoil. The particular revegetation practice used in an area depends on local laws, physical conditions, and management practices. These factors and the resulting potential for revegetation and other forms of rehabilitation are discussed in a report by the National Research Council (1974).

7.2.4 Regional Differences

Soil types and climates in each mining region influence the rate of direct emission of excess spoil particles.

The Western Region has less precipitation than other regions, but evaporation differs considerably between coal areas in the state of Washington and those in northern Arizona or northwestern New Mexico. Revegetation is very difficult in some of these areas because of the scarcity of moisture. The dryness of the spoil makes it easy for particles to be separated and carried aloft. Some western areas also have high prevailing winds that easily blow dry surface particles. In the spring and summer, the dry soil and high winds combine to produce many storms.

The Midwestern Region has more soil moisture than the Western Region, and it is flatter than the Appalachian Region. The higher soil moisture reduces the dust emission rate at a given wind speed.

The Appalachian Region, like the Midwestern Region, has more precipitation and soil moisture than the Western Region, thus reducing the lofting of spoil particles at a given wind speed.

7.2.5 Measurement of Air Quality Impact

The pollutants that would need to be measured to determine air quality impacts include particulate matter, carbon monoxide, nitrogen dioxide, and hydrocarbons. The low concentrations of gaseous pollutants have negligible health effects; by contrast, particulate concentrations are occasionally high. There are numerous instruments to sample various size fractions of the particulate matter, and numerous techniques to determine the chemical constituents of the spoil.

7.2.6 Modeling the Air Quality Impact of Excess Spoil

The purpose of modeling is to compute the rate at which a pollutant is emitted into the atmosphere and transported to places of interest, including its final "disposal" site. In the study of excess spoil disposal, models are expected to predict the rate of emission and the movement of spoil particles resulting from different methods of excavating, transporting, and storing spoil. Collins et al. (1980) list the emission factor in total suspended particulates for each operation in a mine, the emissions from internal combustion engines (given in seven categories for pollutants from three types of vehicles), and the data on the mine production operation needed for a complete emission inventory. Additional information may be found in EPA (1976, 1977, 1978, 1979) and Evans and Cooper (1980).

Different modeling approaches are needed to compute statewide emissions, individual spoil-pile emissions, the spoil emissions created by a specific kind of machine, and the combustion products of that machine. Complex models are needed to predict concentrations of pollutants near the source, because there are so many variables of topography, machine dynamics, and local air flow. A more reasonable approach would be to compute the total annual emissions from each part of the operation. Comparison of the annual emissions of each disposal method would give some indication of the difference in air quality impacts. Evans and Cooper (1980) present empirical models of the particulate emissions from surface mining and the use of vehicles on unpaved roads. The latter model can be used to examine the difference in emissions from end-dumping and from transporting excess spoil to the bottom of a fill. More research is needed to develop an empirical model of the air emissions produced by the cascading of end-dumped spoil downslope.

7.2.7 Summary

There is only a small amount of literature on the impact of spoil disposal on air quality, and few investigators have been involved in measuring the impacts. The results of some of these studies have not been reported. This slow progress seems to be partly caused by the fact that no single agency has a mandate to study the subject.

Although there is no evidence that the impact of excess spoil disposal on air quality is a threat to the health of human beings or to vegetation and wildlife, further research on this topic should be undertaken (see Appendix B).

7.3 LAND IMPACTS ASSOCIATED WITH EXCESS SPOIL DISPOSAL

7.3.1 Erosion and Sedimentation

Soil erosion refers to the detachment and movement of soil or rock particles by water, wind, ice, or gravity. In coal mining, erosion by water is usually the greatest problem, and can produce severe effects on the land--loss of topsoil, reduced soil productivity, seed bed destruction, reduced vegetative cover, exposure or transport of acid materials, disruption of the land surface, stream sedimentation, chemical pollution of surface waters, destruction of aquatic habitat, disruption of aquatic food chains, and reduction of storage or reduced stream channel capacity. Only some of these impacts occur at any given site, but all of them have occurred at various times in the coal mining regions.

The rate and severity of soil erosion are usually considered to be controlled by four classes of variables--vegetal, soil, precipitation and topographic factors. All of these except precipitation are subject to some degree of control by the OSM regulatory program. Issues concerning soil as a resource in relation to surface mining for coal have been addressed by the NRC (1981).

7.3.1.1 Vegetation Vegetation is probably the most effective deterrent to soil erosion (Smith and Weschmeier 1962). If some critical level of vegetative cover is not provided, erosion removes the surface soil mantle at a rate that depends upon both soil and nonsoil factors, such as slope and precipitation.

The benefits provided by vegetal cover are primarily the protection of the soil surface from raindrop impact and the consequent puddling of the surface, detention of surface runoff, enhancement of infiltration of water into the soil, accumulation of soil organic matter, soil-holding action due to plant root systems, and increased hydraulic surface roughness.

7.3.1.2 Soil It is difficult to characterize the influence of soil factors upon soil erosion, and many important questions relating to this subject remain unanswered. This is partly due to the difficulty of isolating soil factors in the presence of vegetal factors. An additional difficulty is the multiplicity of soil erosion criteria (Farmer and Van Haveren 1971). The weight of eroded soil, the weight of eroded soil per unit area, numerous measures of soil aggregation, stream turbidity, and several soil indices have all been used. However, soil erodibility is often related to such physical characteristics as soil structure, texture, organic matter content, moisture content, and permeability. The relation of these factors to soil erosion on coal mine excess spoil embankments needs further research (see Appendix B).

7.3.1.3 Precipitation Nearly all of the present information concerning the influence of precipitation factors upon soil erosion has been obtained from studies on agricultural lands (Heinemann and Piest 1975, Pimentel et al. 1976).

With respect to point estimates of soil erosion at a given time or over a given period, the precipitation factors of major interest are rainfall intensity, total amount of rainfall, rainfall kinetic energy or momentum, and sequence and direction of storms over a short period (rainy spells). In the western United States, surface runoff from rainfall tends to be an infrequent event, but spring snowmelt may be an important consideration.

As interest in soil erosion expands, interest in precipitation characteristics must likewise expand to include the spatial and temporal characteristics of precipitation: frequency-intensity, frequency-duration, depth-area-duration, and yearly distribution pattern for all regions, with particular attention to mountainous upland areas (see Appendix B).

7.3.1.4 Topography Topographic influences on soil erosion can be of considerable importance. Variations in topographic features affect the buildup, concentration, and velocity of runoff. The topographic factors of primary concern are slope gradient and length.

As slope steepness increases, there is a corresponding increase in the velocity of surface runoff. As runoff velocity increases, runoff waters move larger soil particles, more materials are transported, and soil particles are transported farther downslope.

Long, unbroken slopes promote the concentration of runoff by minor topographic variations and surface irregularities. Eventually, runoff may concentrate into narrow channels, resulting in rill and gully erosion.

Most data on the effect of slope on erosion have been developed on agricultural lands of only slight slope, i.e., 20 percent or less. The relative effect of slope steepness on erosion from raindrop splash, as opposed to effects of steepness on velocity and concentration of overland flow, has not been studied. Both are important. Ekern (1951) found that the relative downslope movement of splashed particles was 50 percent plus the percent of slope. From kinematic theory we may conclude that the velocity of overland flow will vary as the square root of the slope, i.e., water will flow down a 40 percent slope with twice the velocity of water on a 10 percent slope. By doubling the velocity of overland flow, we increase its kinetic energy 4 times; kinetic energy varies approximately as the square of velocity.

Several extensive studies (Musgrave 1935, Horton 1945, Foster and Weschmeier 1973) of runoff and erosion on upland areas have used some measure of slope as a factor in the analysis. These studies have met with variable success, and while they have sometimes given some insight into the factors affecting erosion, they offer little knowledge of the processes involved in erosional soil losses.

The influence of slope length on erosion has proved to be particularly difficult to analyze. In the mining context, with relatively long, unbroken slopes, slope length is important in both the control of erosion and the costs associated with interrupting continuous slopes by constructing terraces or benches.

Research is needed on erosion rates for subsoils, graded or ungraded spoils, and replaced topsoils and subsoils. Sediment delivery ratios also need to be examined, and the quantitative effect of slope length should be further investigated.

More than 2 decades of use have confirmed the utility of the universal soil loss equation (USLE) for soil conservation planning (Weschmeier 1959, Weschmeier and Smith 1965, Farmer and Fletcher 1976, Israelsen et al. 1980). There is no doubt of the effectiveness of the USLE when used for this purpose. However, during the past decade the USLE has frequently been used for purposes never envisioned by its author (Weschmeier 1976). The limitations of the original data base have been overcome by a series of "Band-Aid fixes" to permit its use on a national basis for erosion prediction as well as for conservation planning in both agricultural and mountainous areas. The application of the USLE to excess spoil embankments is a highly questionable practice. The major limitations of the USLE have been pointed out by Israelsen et al. (1980):

1. Empirical coefficients are used to overcome the semiempirical nature of the equation and do not necessarily express its several factors in their correct mathematical relationship. Data forming the basis for the present coefficients were limited to maximum uniform slopes of 20 percent and lengths of 300 ft.
2. The rainfall-erosion index measures only the erodibility of rainfall and associated runoff. Therefore, the equation does not predict soil loss that is due to thaw or snowmelt. In areas where such losses are significant, they must be estimated separately and combined with those predicted by the equation.
3. Gully erosion caused by concentrated flows of water cannot be accounted for by the equation. Its use must be confined to sheet and rill erosion.
4. The equation was developed to predict soil loss on an average annual basis. Soil-loss predictions on a storm-by-storm basis often result in error because of complicated interactions between the forces governing soil-loss rates. On any given site, these interactions tend to average out over a year's time, so that their discrepancies are minimal.

It should also be recognized that the USLE is only remotely related to the amount of sediment passing some observation point. Sediment-delivery ratios are a separate, and crucial, topic. Finally, the USLE is not a quantitative predictor; it is semiquantitative at best. Order-of-magnitude errors are the rule, not the exception. The accuracy of the USLE in measuring losses from mining disturbances needs to be determined.

7.3.1.5 Erosion on Excess Spoil Embankments The OSM regulatory program specifies the procedures to be used in the disposal of excess spoil, regardless of the disposal structure; i.e., valley fills, head of hollow fills, or durable rock fills. For the purpose of discussion, excess spoil disposal can be organized into three phases: site preparation, fill construction, and cover establishment.

Under OSM procedures, the greatest erosion potential exists when extensive areas of bare soil or spoil are exposed to the erosive forces of precipitation and runoff. With a given set of climatic conditions, the erosion potential of bare soil is primarily related to soil properties and topography. Additionally, the duration of each phase of the disposal process will greatly influence the degree of hazard. The rapidity of establishing a vegetative cover has a great influence on soil erosion.

7.3.1.5.1 Site preparation Major factors contributing to soil erosion during the site-preparation phase of waste disposal include lack of vegetative cover; long, uninterrupted slopes; steep slopes; exposure of less permeable subsoils; degradation of soil structure; and compaction and sealing of newly exposed surfaces.

Where productive topsoil occurs, its loss during site preparation is of special concern. Significant loss of this resource may seriously diminish the subsequent productivity of a reclaimed site. However, erosional losses can be minimized by rapid completion of site preparation on small disposal sites, appropriate placement and storage of stockpiled topsoil, preparation of large disposal sites in successive stages, and appropriate diversion of water around the perimeter of a disposal site.

7.3.1.5.2 Fill construction Placement of spoil in a fill may result in substantial erosion. Compaction of fill layers to achieve stability diminishes infiltration and results in increased surface runoff. Unconsolidated materials on the slope face of a fill are very susceptible to erosive forces, and minor irregularities on the slope face or improper diversion of excess runoff from the fill may concentrate flow, promoting rill and gully erosion.

Grading and shaping of completed fill establishes a new drainage system (Williams 1972). As a result, erosional losses may be significant until vegetative stablization is complete. Depending upon the techniques employed, grading and shaping may promote or diminish erosion.

Grading and shaping techniques beneficial to erosion control include:

a. Roughening and loosening the soil surface parallel to contours;
b. Contour furrowing;
c. Contour gauging;
d. Contour deep chiseling;
e. Reducing slope length (terracing); and
f. Reducing slope gradient.

Grading and shaping techniques detrimental to soil stabilization include:

a. Backblading and working the seed bed to a fine tilth;
b. Furrowing, gauging, and chiseling across contours, and running tracked vehicles along the face of the slope;
c. Creating long, uninterrupted slopes;
d. Creating steep slopes;
e. Creating convex slopes; and
f. Concentrating flow in unstable channels.

As in the site-preparation phase, erosion control during fill construction can be enhanced through proper water interception and diversion.

7.3.1.5.3 Cover establishment The physical characteristics of topsoil may make it less erodible than coal spoil. Topsoil generally contains greater amounts of organic matter than spoil, and topsoil usually has granular structure. Both of these topsoil characteristics promote rapid infiltration and hence reduce runoff and erosion. However, until a vigorous vegetative cover has been established, topsoil is subject to erosive forces.

Rapid development of a vigorous, protective plant cover requires proper seed-bed preparation, soil amelioration (amendment), mulching, and plant species selection. Improper planning and implementation of revegetation can result in unnecessary erosion. Factors that may contribute to erosion during revegetation are tillage across contours, excessive compaction, backblading, inadequate mulch, improper plant material selection, improper selection of planting season, and seeding delays subsequent to seed-bed preparation.

Where exposure of topsoil is minimized through rapid revegetation, potential soil erosion during the cover-establishment phase of waste disposal is less consequential than during other phases. This is primarily due to the shorter duration of exposure, the increased organic content of topsoil, the granular structure of topsoil, the decreased slope gradient, and the use of protective mulch.

7.3.2 Long-Term Productivity of Excess Spoil Embankments

The long-term productivity of excess spoil embankments in terms of timber and forage is as yet unknown. As a generalization, within the constraints of climate and vegetative types the ultimate productivity of a site is closely related to the soils and the development of the edaphic qualities of the spoil. Assuming acceptable, long-term stability of a spoil embankment--which implies that soil erosion processes are on par with soil-forming processes--the development of the nutrient-cycling capabilities of the spoil seem paramount.

There appears to be little evidence that long-term productivity will be significantly less than productivity before mining (NRC 1981). The one notable exception is in the case of acid mine drainage from excess spoil embankments. Precluding that, the greater depth of soil materials compared with premining soils, for most sites, would indicate the distinct possibility of modest increases in site productivity.

Three points bear particular relevance to long-term site productivity:

1. For the most part, excess spoil embankments are left as pasture or forest cover when higher uses are not defined. Of most importance from the national view is assuring site stability in order to maintain long-term site alternatives.

2. Plant communities change over time. Whatever the plant materials used to revegetate a spoil embankment, they will bear little relation to the plant materials on that site 50 years later. The influence of contemporary revegetation is primarily to slow down or speed up the development of the plant community that would appear

naturally in the course of normal plant succession, not to change its composition.

3. It is not realistic to stipulate high levels of site productivity without assuring high levels of land management.

7.3.3 Land-Use Potentials

For excess spoil dumps occupying particular sites, land-use potentials are near-term considerations. Excess spoil embankments occupy sites formerly devoted to some other use, often forests. That is part of the trade-off, and the extraction of energy resources often results in a change from forest to pasture, from coniferous forest to hardwood, from agriculture to forest, from mountaintop to flat area, and so on. All of these changes influence the lives of local people.

If coal mining in general, and excess spoil disposal in particular, results in changed land uses involving many other sorts of trade-offs, an important question is which changes in land-use potentials are acceptable, and over what time period. In most cases, the individual states are in the best position to assess the needs of their region and the wishes of the people affected. Even in the case of coal mining on federal lands, state input must be solicited and judiciously considered. In turn, state regulatory agencies should develop the necessary staff and expertise to assess the overall impact of land-use changes and to make justifiable value judgments.

7.4 IMPACTS ON FISH AND WILDLIFE

The disposal of excess spoil has direct and indirect impacts on fish and wildlife resources. Direct impacts are typically limited to the disposal site, where habitat and associated fish or wildlife productivity are altered. Indirect impacts occur off site, where short- or long-term alterations of habitat components (e.g., water quality) reduce or eliminate fish and wildlife resources.

The elimination of habitat is an accepted consequence of surface mining. The area disturbed by a mining operation can be incrementally increased when mining methods are altered to take full advantage of excess spoil disposal options (e.g., head-of-hollow fills or mountaintop removal). A direct estimate of impact can be made by determining the area covered by spoil disposal. The elimination of vegetation and the disturbance of topsoil and soil-related macrofauna and microfauna have adverse impacts even if topsoil is used as topdressing for the fill material. The elimination of vegetation causes the loss of fish and wildlife resources associated with that area. It has been argued that mining is a temporary use of the land, and fish and wildlife resources will only be displaced by mining activity. Temperate ecosystems are typically at or very close to their carrying capacity, and the displacement of organisms for the mined site will either cause displacement and loss of off-site biota, or displaced organisms will compete poorly and perish. The end result is the loss of equivalent resources when a site is disturbed.

The issue of temporary use of the site during mining should also be addressed in a discussion of direct impacts. The disturbance or alteration of any community of organisms or ecosystem will have short-term as well as long-term effects (Cairns et al. 1977, Cairns 1980). A well-known effect of disturbance is the alteration in the species present following the disturbance. It is likely that the ecosystem will remain and function effectively, but delicate balances between species will have been altered, and changes in ecosystem characteristics should be expected (McIntosh 1980). On mined land, particularly at excess spoil disposal sites, the nature of the habitat will have been dramatically altered. Conditions on the site will change with time, and with proper management fish and wildlife resources may meet the objectives of premine planning, but the site will be different; many species will be eliminated. Thus any increase in the area of disturbed habitat caused by excess spoil disposal can have direct, long-term effects on fish and wildlife resources. These impacts can be reduced by planning spoil disposal to affect the least area possible while maintaining stability and providing for public safety.

The indirect impacts associated with improper excess spoil disposal are associated with off-site disturbances. Spoil disposal sites can be subject to erosion and associated sedimentation in streams. Similarly, the weathering of spoil materials or indiscriminate disposal of toxic material may cause minor or major alterations in chemical water quality.

The biological life in streams and the related aesthetic values can be drastically altered by mass failures in spoil embankments. Generally, the influence of stream sedimentation on aquatic life has a larger effect on macroinvertebrate benthic organisms and on the disruption of food chains than on the nature fish themselves.

Sedimentation typically has two major effects on fish and wildlife resources, with the more significant impact affecting aquatic organisms (Farnworth et al. 1979). First, an increase in sediment loading alters stream habitat by blanketing the stream bottom with silt. This process may smother and kill organisms, especially fish embryos and fry, or reduce habitat availability, reducing stream organism numbers and productivity.

The second impact is associated with direct effects on fish and other aquatic organisms. High levels of suspended solids in streams and ponds can result in reduced photosynthetic activity by reducing the penetration of light into the water. Large amounts of suspended solids also interfere with the respiratory processes of gilled animals (Coker 1968). The suspended particles can cause abrasion, which damages tissues such as gill structures, and turbid water increases susceptibility to infection by fungi and bacteria (Bell 1973).

The alteration of chemical characteristics of streams draining mine sites is well documented (NRC 1979). These alterations can include minor modification of ionic concentrations or may involve severely degraded water quality due to acidic or alkaline mine discharges. Although minor changes in ionic concentrations do not have major short-term effects on aquatic organisms, the long-term consequences are unknown. Considerations similar to the previous discussion of habitat alteration or elimination apply in this case as well. Land disturbance does alter chemical characteristics of streams, producing variable effects on stream organisms.

Water quality can be severely degraded if toxic or acid-producing spoils are improperly placed in fill material. The effects of acid mine drainage have been well documented, and include toxicity to aquatic organisms as well as reproductive impairment and general alteration of steam communities.

Other indirect impacts are site specific and depend on mining methods, total areas disturbed, and sequencing of mining operations.

7.5 ASSESSMENT OF MASS STABILITY AND MASS WASTING AND THE CONSEQUENCES OF FAILURE

In any spoil mass with an upper surface that is not horizontal, shearing stresses develop internally, tending to move the upper portions downward. When these internal shear stresses exceed the shearing resistance, movement will occur. If the volume of moving material is large, massive slope failure results. Failures that are deep-seated and that involve the sudden movement of large earth masses are commonly known as landslides. Contrasted with landslides are such surface phenomena as erosion, scour, shallow surface flows, debris slides, and debris flows.

When a large earth mass breaks away from a main slope and moves outward as a relatively intact mass, the movement is referred to as a mass slide, two varieties of which are rotational slides and translatory slides. In rotational slides the failure surface of the sliding mass has a cross section that approximates a segment of a circle; the failure surface of a translatory slide is some natural plane of weakness.

Vegetation is generally regarded as ineffective in preventing landslides. While vegetation, particularly a heavy ground cover of grasses, forbs, and legumes, is very effective against erosional losses, vegetation also promotes infiltration of water into spoil embankments. If a spoil embankment cannot safely transmit this additional water, the prospect for slippage of the spoil material is increased. Deep, woody root systems, like those of trees and some shrubs, may stabilize the upper several feet of spoil materials. Because they take time to grow, however, trees are of little help in stabilizing spoil materials during the early years following mining (Council on Environmental Quality 1973).

The discussion that follows deals with mass movements in general and is not based on specific studies of excess spoil piles. However, the general principles are directly applicable to excess spoil structures because the same types of natural materials are involved.

All of the types of failures noted in natural earth materials have also been noted in waste dumps associated with mining for commodities such as copper and other metals. Spoil-pile stability also depends on the natural stability of the disposal site, i.e., the natural valley slopes.

Landslides--the mass movement of earth materials--can be the result of spoil-pile or waste-pile instability (see Working Paper I) in any of the three mining regions of the United States, but it is only in the Eastern Region that natural mass movement is a significant geomorphic process. The steep slopes of the Eastern Region, with resistant rocks capping weak rocks and with abundant precipitation, create ideal conditions for slope failure by landsliding. A summary of landslide problems and control measures is provided by Schuster and Krizek (1978), and an indication of the extent of the problem in the northern Appalachian Plateau area of West Virginia is presented by Lessing et al. (1976).

Landslides in West Virginia occur most frequently on concave slopes (coves). The potential for mass movement increases when the water content of the slope or spoil material is concentrated, either as a result of large storms or of human activity. Adding materials to the face or to the top of a slope, or undercutting a slope by stream shift or by human activities leads to slope instability. Removal of deep-rooted vegetation may also lead to landsliding when the roots decay.

The West Virginia study (Lessing et al. 1976) indicates that slope aspect has little influence on the frequency of slides, but that slides occur most frequently on slopes of intermediate inclination, between 15° and 35°. This may appear anomalous, but obviously landslides will not occur on gentle slopes, and steep slopes are usually comprised of resistant rocks and thin soils.

Landslides pose a problem for spoil disposal in the Eastern Region because both the disposal pile and adjacent valley sides may fail. Valley-side slopes may fail prior to, during, or after spoil disposal. During the early stages, landslides pose a hazard to life and property and, beyond that, landslides can render spoil unstable and susceptible to surface erosion after completion of the fill and abandonment of the site.

7.5.1 Failure Modes

7.5.1.1 **Postconstruction Settlement and Creep** Postconstruction settlement and creep are not direct causes of slope failure. However, they may be secondary causes by altering drainage systems that introduce additional water into an embankment.

Settlement in spoil embankments results from consolidation of the foundation and from compression of the spoil material, particularly shales. The magnitude and rate of foundation settlement depends on the foundation materials and their susceptibility to compression. Foundation settlement usually constitutes only a small portion of total postconstruction settlement.

The compression of spoil material is associated with the weight of the overlying material, and probably results from particle movement and particle crushing (Riker et al. 1978). The rearrangement of particles into a more compact structure results in a decrease in the void ratio of the materials. Most of this settling occurs during the construction period. However, even after completion of an embankment there continues to be some settlement at a gradually decreasing rate. This slow process is usually referred to as creep settlement.

7.5.1.2 Deep-Seated Slumps and Rotational Slides Deep-seated slumps usually occur along discrete slip lines or shear surfaces. The material usually moves as individual blocks or a series of blocks. Bedrock or soil remains as a coherent unit within the individual slump blocks (Lessing et al. 1976). These failures typically involve the downslope rotation of detached blocks along curved slip surfaces. Sliding surfaces generally do not extend below an embankment into the foundation.

Fully developed rotational slides are not common in excess spoil embankments, although they have been associated with noncoal mining. Their occurrence can generally be attributed either to excessive embankment height or to a reduction in toe support caused by internal ground-water systems or excavation near the toe. The speed of movement ranges from slow to moderate (Nilsen et al. 1979). Large ground-water accumulation in excess spoil embankments tends to produce faster sliding rates.

7.5.1.3 Shallow-Flow Slides and Earthflows Shallow-flow slides result when the water content in spoil material permits it to flow as a plastic or viscous material. In excess spoil embankments these flows are common and cause moderate damage to vegetation. Usually these flows are not large. Flow can take place in one or more lobes that move at different rates, depending on the viscosity and water content of the spoil or upon the steepness of the slope. Most of these flows occur during or shortly after periods of extended rainfall or snowmelt.

The movement of shallow flows in spoil embankments ranges from moderate to rapid. A common triggering mechanism is seismic disturbance, including blasting, that occurs during periods of much water accumulation within spoil embankments, e.g., during an extended rainy period.

Shallow-flow slides can move considerable distances. However, the materials involved are only surficial.

7.5.1.4 Foundation Slides Foundation slides are caused by shearing at the contact with or below an embankment slope. Sliding of this type is often associated with end-dump placement or fill placement on steep slopes.

Slope movements initiated below an embankment frequently cause a wedge-shaped portion of a slope to translate out from the embankment, and the foundation soils spread or are squeezed ahead of the advancing toe. If embankment construction is continued, the foundation failure progresses in the direction of dumping. If the movement of the foundation soil is restricted horizontally, movement can become vertical.

Embankments placed on steep slopes may slide along the area of contact between the embankment and the foundation. The size of the direct impact area below the slide will vary with the slope of the natural ground--steeper slopes potentially cause more damage than lower slopes. To prevent this type of failure, foundation steepness at disposal sites should be restricted, and adequate foundation preparation should be required. The slope of the natural ground is one determinant of both the potential for sliding and the consequences of sliding (Vandre 1980).

7.5.1.5 Slides and Flows of Debris Debris slides and flows pose danger to human life because they move so rapidly (Lessing et al. 1976). Typically, they involve larger masses of material than shallow-flow slides or earthflows. In debris slides the movement may be slow to rapid, but the spoil is not water-saturated. Movement is by actual sliding, usually with the sliding mass breaking up into individual units. Speed of movement is directly related to slope steepness. The distance of movement may be considerable. While these slides are not saturated, water percolating into the fill can trigger a slide. For this reason debris slides often occur at a point where surface waters are introduced into fill through cracks or crevices.

Debris flows result from processes closely related to the liquefaction of fine sands and silts. These materials can occur in excess spoil fills and could possibly form debris flows. Debris flows, like liquefaction flows, apparently are a result of high pore-water pressures, but unlike the typical liquified sand, the debris can maintain mobility and essentially undrained conditions as long as it is mixed. The most important difference is the clay-mineral content of debris flows. A mixture of clay minerals and water has some strength which, in combination with the density of the clay-water slurry, is capable of supporting large particles of sand and small pebbles. Further, the mixture of slurry and fine particles has a sufficiently high density and strength to support large pebbles (Rodine and Johnson 1976). Thus, a debris flow containing as much as 90 percent of solids by weight has such low, undrained frictional and cohesive strengths that it can flow as a blanket over surfaces with slopes as low as 4°. The high mobility of debris can be explained in terms of (a) a wide range of particle sizes (well-graded soil), and (b) sufficient clay minerals in the finest sizes so that, when mixed with water, the clay slurry can keep coarser particles separated and can support the sand and small pebbles in the debris. Thus, many coal mine spoil piles could be excellent debris-flow material. However, study of dozens of source areas of debris flow (Rodine 1974) indicates that most debris flows originate in landslide materials with the properties described above. The landsliding apparently is the causative agent that increases the void ratio of the soil and admixes the soil with water sufficiently to mobilize the unconsolidated material as a flow. Thus the potential for debris flow in spoil can be minimized by compacting the spoil to a dense state and by preventing landsliding. The importance of density of debris in the source area of debris flows has been documented in four areas in California by Rodine (1974). He showed that the water content at field capacity of the in situ soil in four source areas that produced debris flows is very close to the water content required to mobilize the debris as a flow. The ratios of water content at field capacity to water content of remolded mobile debris ranged from 0.91 to 1.13 for the four source areas. In one area the ratio was about 1.03 for clayey soil that produced debris flows and about 0.88 in a sandy soil that did not produce debris flows.

Part of the flow at Aberfan, Wales, according to Bishop (1973), may have been a debris flow (see Working Paper I). Eyewitnesses indicated that the flow was moving at 10-20 miles per hour, but that as soon as the flow stopped, the material was firm enough to stand on. The central part of the flow, however, picked up water from springs at the toe of the landslide of one dump (Tip Number 7) and transformed that part of the flow into a "mud run."

7.5.2 Safety Of Excess Spoil Embankments

All spoil embankments are to some degree potentially unstable. Instability can occur because of inadequate engineering, variations in natural conditions, construction practices that vary from the engineered design, or human error. A factor of safety in the design of spoil embankments allows for an unspecified margin of error between the design parameters and assumptions and those that actually exist at a proposed site. However, designs that assume the simultaneous occurrence of several adverse events are not considered to be prudent engineering. For example, assuming a saturated fill because of a drainage malfunction and the simultaneous occurrence of a severe ground acceleration due to an earthquake will yield a very conservative design. This compound condition is possible, but highly improbable. Prudent engineering considers those conceivable conditions but tempers them with what is probable (Vandre 1980).

The selection of a factor of safety for spoil embankments should consider (Vandre 1980):

- The consequences of mass failure
- The adequacy of field investigations
- The reliability of design assumptions
- The ability to predict adverse conditions
- The possibility of construction deviations
- The judgment of the designer based on past experience

The factor of safety for the short-term construction phase can sometimes be justifiably lower than that for long-term stability. The lower factor of safety is justified by the comparatively short-term risk and by the better opportunity for remedial measures, including reconstruction.

A relatively new approach to mass stability problems, based on probability analysis and risk assessment, has been suggested by Wu and Kraft (1967). Since that time there have been significant advances in the development and application of probabilistic methods in the field of geotechnical engineering.

7.5.3 Consequences of Massive Failure

The consequences of massive failure range from catastrophic to minimal, depending mostly on the type and size of failure and its closeness to human beings. Many, or even most, failures are shallow-flow slides with minimum damage and no long-term consequences.

7.5.3.1 Endangering Human Life Disastrous embankment failures are quite rare. However, the Aberfan, Wales, failure of October 21, 1966, caused the death of 144 people. More recently, the Buffalo Creek failure at Saunders, West Virginia, on February 26, 1972, killed 125 people and resulted in property damages exceeding $65 million (see Working Paper I). The lack of application of basic engineering design principles, especially for drainage control, was a significant factor leading to these failures. Although neither of the failures was in an excess spoil embankment, the spectre of the disasters has played a large role in the development of current thought regarding the mass stability of excess spoil embankments. CODES received information on various failures in excess spoil structures in the Eastern (Appalachian) Coal Region, but found no evidence of serious massive failure. The defects that were apparent were of a superficial nature, such as surface settlement and slumping and minor movements; some problem fills had improperly constructed drainage divisions leading to rilling and gullying. Still, there has been little experience with the stability of excess coal mine spoil fills, and the possibility that massive failure might occur should not be dismissed.

7.5.3.2 Erosion and Sedimentation Severe sedimentation of stream channels is the most common consequence of massive failure. Streams that flow over and through landslide deposits tend to aggrade in their lower reaches or to deposit alluvial fans, or to meander or braid widely. As a result, deposition of large sediment loads in stream channels forces an alteration of course on practically an annual basis (Bailey 1971). In turn, increased sediment loads in stream channels decrease the capacity of the channels to transmit floods. This effect has occasionally resulted in flooding from storms that could have safely passed through the original channels. Severe mass failures can also result in considerable property damage several miles downstream from the failure, including damage to structures, residential or commercial property, and deposition of silt, gravel, or rock on agricultural lands. Sedimentation also affects the biological life in streams (see Section 7.4).

7.5.3.3 Water Quality (Chemical) The primary adverse influence of mass failure in spoil embankments on chemical water quality results from the introduction of chemical ions into the surface water system. The magnitude of impact depends upon the concentrations and toxicities of the ions that are introduced. If spoil materials associated with a failure contain sulfide minerals, the problem is exacerbated by the introduction of acid and acid products into the stream system.

The primary environmental consequences associated with reduced chemical water quality can range from negligible to severe. Affected areas include riparian vegetation, aquatic food chains, fisheries, aesthetics, reduced property values along affected streams, and scour of streambeds and streambanks.

7.5.4 Societal Effects

Studies of the social impacts of mining have not discriminated between the effects due to the disposal of excess spoil and the other effects of mining. Studies made before the enactment of SMCRA do not address the impacts of spoil disposal under OSM regulations. The impacts of pre-SMCRA disposal practices will be felt by landowners and communities in some areas, particularly some of the areas of steep-slope mining in central Appalachia, until mass and slope stability are reestablished either by natural processes or deliberate reclamation. These effects will include erosion and sedimentation in excess of the natural rate, slumps and landslides, impaired water quality, and visual blight.

The COSMAR report (NRC 1979) briefly discussed some social consequences of mining--the characteristics of society most likely to be affected, the societal groups most likely to influence the outcome, the "boom-town syndrome," and ways of coping with community disruption. The COSMAR report did not discuss the societal impacts of past or present practices in the disposal of excess spoil. Hunt (1976, pp. 43-45) discusses the reactions of some people who suffered damage to their property from landslides. Their reactions and attitudes are in many ways similar to the reactions and attitudes of those who have suffered damage to their property, water supply, and environment from past waste disposal practices.

7.5.5 Postfailure Remedial Actions

Unless failures of excess spoil embankments result in an immediate threat to public health and safety, the remedial response is frequently limited to only the most necessary clean-up work. Avoidance of massive failures is, however, preferable to remedial actions.

The size of the mass failure conditions the remedial response. Small slides frequently are totally contained on the spoil embankment and require minimal action. On larger slides that create impacts for some distance downstream, there are two types of remedial actions: excavating and grading the affected downstream areas, and hauling the spoil back to the original site for reconstruction of the spoil embankment. The latter alternative is rarely used.

The expectation that spoil embankments will be stable into the foreseeable future, perhaps long after the operating company has ceased to exist, may not hold. The operating coal company has legal responsibility during the bonding period, and the extent of any remedial actions required may be determined by whether the bonding regulations include such liability, and for how long. Once the coal operator has his bond released, the legal responsibilities are not clear.

A study (Resource Technologies Corporation, in press) under contract with OSM is looking into questions of legal responsibility and liability in the event of catastrophic occurrences long after completion of mining and reclamation and release of any bonds. Failure of head-of-hollow or valley fills is one of the events included, along with subsidence, acid mine drainage, and others. Various institutions available for dealing with questions of liability and legal responsibility, including financial or other alternatives that have been used in the past, are outlined in the study. Methods will also be discussed by which government agencies and private industry may handle responsibilities associated with long-term risks of catastrophic failure in general, and institutions available to governmental agencies to handle long-term risks associated with coal-related catastrophic events will also be examined.

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Chapter 8

ENGINEERING AND RELATED PRACTICES IN THE DISPOSAL OF EXCESS SPOIL

8.1 INTRODUCTION

The proper design of stable embankments (valley fills, head-of-hollow fills, or durable rock fills) for the disposal of excess spoil from surface coal mining requires a broad range of knowledge in disciplines such as geology, engineering geology, hydrology, hydraulics, soil science, and geotechnical engineering. At the same time, the engineer must take into account a number of economic questions, including the potential value of the land used for the disposal site, the costs of labor, equipment, and fuel used in building the embankment, the relationship of the embankment site to the most efficient extraction of coal at the mining site, and the stability of the disposal site for future utilization.

The following sections discuss some of the engineering procedures that should be considered in designing facilities for the disposal of excess spoil. Some of the procedures were taken into account during the writing of the Office of Surface Mining (OSM) regulations under the Surface Mining Control and Reclamation Act (SMCRA), but many were not. In addition, a number of other factors need to be considered in designing and constructing excess spoil fill embankments; these include fill-site topography, spoil characteristics and composition, drainage, and revegetation. Actual construction techniques and methods of placement and compaction are discussed in Chapter 4.

8.2 GENERAL ENGINEERING ANALYSIS OF THE SITE

The process of site selection for spoil structures is similar to that for other geotechnical projects. An important initial consideration is the proximity of the disposal site to the location of the surface mine. Every effort is made to reduce haul distances so that haulage equipment requirements can be minimized. Further considerations include the locations of populated areas, transportation facilities, and utility lines. Adequate land must be available not only for the spoil disposal area itself but also for the area below the fill structure, so that proper sedimentation control facilities can be constructed. Further, surface- and ground-water hydrology must be investigated to determine the water-handling requirements as well as the appropriate internal drainage structures for the fill.

An important, yet often neglected, part of spoil facility design is the specification of the operation and maintenance of the fill during construction. Problems can occur even with a well-designed spoil disposal facility if proper construction control is not provided.

8.2.1 Site Investigation

Site investigations by geotechnical engineers and engineering geologists are required to determine the suitability of locating a particular type of spoil disposal facility at a particular site. Geotechnical engineers have developed soil mechanics to the point that, in many cases, design problems can be solved largely by mathematical procedures, some of which will be described in following sections. The calculations are generally based on simplifying assumptions concerning the properties of the natural soil and rock as well as of the spoil itself. The properties of the spoil can be determined relatively well, and the essential properties required for stability can be controlled sufficiently during construction. Errors in the calculations of the stability of spoil structures therefore result almost entirely from geological factors. Hence the adequacy of a particular engineering design for a specific site depends to a large extent upon the adequacy of the geological and geotechnical investigations of foundation conditions. The essential steps in a geotechnical and geological investigation of a site for any earth structure have been described by Terzaghi (1961a).

A preliminary step is the collection of relevant information regarding the geologic characteristics of the site. The information may be gathered from publications and from geologists familiar with the local geology as well as from detailed study of rocks and soils throughout the site. Preliminary interpretation of these data depends upon understanding the engineering significance of the various materials encountered; i.e., the interpretation is based on the correlation of the soil and rock types with the engineering properties of these materials. The interpretation depends largely upon the experience and training of the engineer and the geologist performing the investigation.

On the basis of the data collected during the preliminary investigation, the knowledge of which data are relevant to engineering properties, and the general layout of the proposed spoil structure, the investigator determines the physical locations of potential trouble. For example, one trouble spot might be a large mass of landslide debris in the foundation area, or a stratum that provides water for a series of springs beneath the proposed fill, or a layer of shale with unfavorable orientation that might provide a locus of shearing giving rise to a large landslide mass.

A following step is to estimate the position and the horizontal and vertical boundaries of the potential trouble spot by means of subsurface exploration. For some problems a series of trenches may suffice to delineate the trouble spot; for others, exploratory borings may be needed. In general, the exploration will involve detailed geologic mapping of the potential site or sites so that the subsurface exploration is performed in the most efficient manner, that is, with the minimum number of borings or trenches. Borings generally are required in order to determine water levels and how they relate to trouble spots.

If a spot of potential difficulty is relatively homogeneous, it should be explored and sampled so that a series of relevant laboratory tests can be made. On the basis of the test results and of the known geometry of the problem areas, computations can be made for the design of a safe structure. For example, factors of safety might be computed for a variety of designs so that an economical but safe solution to the problem can be determined.

However, if the potential trouble spot is complex--for example, the potential surfaces of deep sliding are extremely nonhomogeneous--a thorough subsurface exploration may not be warranted. Instead, the engineer may proceed along one or the other of the lines (Terzaghi 1961b) discussed in the following paragraphs.

One approach is to base the design on the most unfavorable possibilities compatible with observations of subsurface features. This is not a "cookbook" solution, because it is based on site-specific information. The design may be highly conservative and the construction expensive.

Another approach is to use an observational procedure, in which critical gaps in knowledge about significant properties of the subsurface are eliminated by observations made by the geotechnical engineer and the engineering geologist during construction, with the design being modified during construction to take account of new information.

An essential feature of the observational procedure is for the engineer to assess the most unfavorable conceivable conditions prior to construction and to be prepared with alternate designs to cope with the unfavorable conditions. Thus, although a structure is designed on the basis of the average properties of the subsurface materials, alternative designs for less favorable conditions would be prepared and analyzed before construction begins. Conditions actually exposed during construction may require radical and costly changes in design. Indeed, the costs may be as high as those estimated by assuming the worst conceivable conditions (Peck 1962).

A second feature of the observational procedure is to plan and execute field measurements that will disclose unfavorable conditions. If critical measurements cannot be made, the observational procedure should not be used. Instead, the conservative design procedure should be followed (Peck 1962).

Finally, whether the conservative or the observational approach is followed, some means must be provided to monitor the performance of the structure after it is completed. The monitoring might include settlement measurements or measurements of pore-water pressure, for example, depending on the nature of the potential spots of trouble and the degree of hazard posed by failure of the structure.

Although the procedures outlined above are essential to sound practice in geotechnical engineering and engineering geology, particularly where foundation conditions are difficult, they are not procedures recognized in the regulations promulgated by OSM.

8.2.2 Methods of Stability Analysis

After the optimum site has been chosen and the site investigation has been completed, stability analyses are made. A stability analysis results in a factor of safety against sliding, which is the ratio of forces resisting failure to the forces that tend to cause the structure to fail. Stability analyses are performed utilizing the strength values obtained from laboratory tests, with anticipated water conditions or ground-water levels within the embankment. These values, along with various geometric configurations of the embankment, are analyzed to determine the factors of safety. Typically, the geometric configuration, or the outslope of the embankment, is varied until an appropriate factor of safety is achieved. The most likely shapes and positions of slip surfaces are determined largely by observations made during the site investigation. For example, there may be bedding surfaces in the bedrock that could become slip surfaces, or slip may localize along the interface between the soil and the bedrock surface. In any case, various geometries of potential slide masses are investigated until the geometry that provides the lowest factor of safety is determined. A slope which is on the verge of failure has a factor of safety of 1.0. If the computation of stability indicates a factor of safety less than 1.0, failure would be highly likely. The calculations of geometric configurations giving safety factors greater than 1.0 provide a basis for designing acceptably safe fill structures. In general, for earth structures the acceptable safety factor is 1.5 or greater.

Many techniques have been developed for analyzing the stability of slopes, and during the last 40 years two methods have evolved: the finite-element method of slope analysis and the limiting equilibrium method. The finite-element method is a computer technique that solves for stresses and displacements in materials with nonlinear stress-strain properties. It uses small geometric elements of various shapes which can have different properties so that layered or nonhomogeneous embankments and substrata can be analyzed. The limiting equilibrium method is generally a much simpler technique, employing either manual or computer calculations in the resolution of forces and moments in a slope so that the ratio of the resisting to the driving forces or the resisting to the driving moments can be calculated, thereby permitting a determination of the factor of safety. Several comparisons of factors of safety computed by the finite-element method and by the limiting equilibrium method indicate that, in general, the two methods are in agreement (Wright 1969, Duncan 1972, Corp et al. 1975). However, the large computer required for finite-element computations makes the method inappropriate for routine analysis of stability of slopes, and we will restrict further discussion to the limiting equilibrium method.

Two types of limiting equilibrium analysis are used for most computations of slope stability. One type is the circular-arc analysis; the other is the block-and-wedges analysis. The circular-arc analysis assumes that the shape of the failure surface is an arc of a circle in cross section. This assumption was introduced by the Swedish Geotechnical Commission, which conducted studies of numerous landslides along Swedish railways between 1914 and 1922. The simplest method, the Swedish Circle Method of Analysis, was introduced at that time. The method was refined in 1936 by Fellenius, and became known as the Ordinary Method of Slices. It was refined again in 1955 by Bishop and became the Simplified Bishop Method, and then again by Spencer in 1967. All of these types of stability analysis have the disadvantage that some of the forces may be out of equilibrium, so that the analyses only approximately satisfy force equilibrium. Another method, which is applicable for circular, planar, or irregular surfaces of slip was developed at about the same time by Janbu (1973) and by Morgenstern and Price (1965). Their methods have the advantage of explicitly satisfying force and moment equilibrium.

All of these methods involve the following steps in evaluating the factor of safety:

1. A feasible failure surface is selected, according to homogeneity or layering of the materials in the slope. An experienced analyst can readily predict the most likely place for a slip surface by examining cross sections of a slope showing the distribution of soil properties and the distribution of pore-water pressures.
2. Forces and moments acting on each element of the slope are calculated according to an appropriate relation for soil strength and according to equations of force and moment equilibrium.
3. The factor of safety is computed by comparing the shearing resistance necessary for equilibrium to the available shear strength along the potential slide surface.
4. Steps 1 through 3 above are repeated successively with different slip surfaces until the critical surface--the one with the lowest factor of safety--is located.

8.2.3 Information Required for Stability Analyses

The various techniques of computing factors of safety require certain data. The data can be divided into four major categories: (1) embankment configuration, (2) engineering properties of the spoil and foundation or underlying materials, (3) pore-water pressures within and beneath the spoil embankment, and (4) external dynamic forces.

8.2.3.1 Embankment Configuration The configuration of the surface of the spoil pile can be readily determined to suitable accuracy by surveying the ground surface and by graphically constructing profiles of design embankments. After construction, the embankment will be surveyed in order to check stability. An important feature of the configuration is the zonation (bands or layers) of spoil with different properties within the pile. Zonation probably can best be estimated by observation of overburden removal and placement. In this way various zones can be located to within roughly 5 ft, both in thickness and in location, without introducing significant error in the stability analyses.

8.2.3.2 Engineering Properties The two most important engineering properties are density and strength. Many of the physical properties of coal mine spoil, such as size distribution, permeability, void ratio, and tendencies to crush, to weather, and to slake affect the engineering properties (see Section 6.3.1).

8.2.3.2.1 Density There are several accurate methods that can be utilized to determine the densities of spoil material. Among these are the sand cone method, the tube sampler, the nuclear densometer, and the balloon densometer. The determination of densities to within 10 percent is a reasonable level of accuracy for stability analyses, and all the methods listed above give accuracies within that range. The sand cone method and the nuclear densometer give results of much greater accuracy than required.

The relative density of spoil material is computed because it is a measure of compaction of the materials and thus of the degree to which the density of the spoil approaches maximum density. The use of laboratory compaction tests and the correlation of the results of compaction tests with field densities are discussed at length in design manuals for earth dams (Army Corps of Engineers 1970, 1971) and in standard texts in soil mechanics (e.g., Lambe and Whitman 1969). These references also discuss the effect of relative density on the permeability and strength properties of granular materials.

8.2.3.2.2 Strength Strength is a critical parameter in stability evaluation and should be established with a reasonably high level of accuracy. A variety of approaches to the determination of strength parameters for spoil and clay soils are available, and include both field and laboratory methods. Direct shear tests in the field or large-scale laboratory testing may be necessary for coarse spoil. Spoils composed predominantly of fine-grained materials are best analyzed by standard laboratory methods, such as triaxial or direct shear tests.

One of the difficult problems in geotechnical engineering is the determination of appropriate values of cohesion and friction, the strength parameters. There are three conditions of experimentation generally used to determine cohesion and friction, and the conditions selected depend on the stage of construction for which stability is to be computed (see Army Corps of Engineers 1970, 1971). The state of consolidation of the test specimens must be similar to those of in situ material (Lambe and Whitman 1969). Further, if the stress-strain curve for the soil has a marked peak, both the peak and residual strengths should be determined. The residual strengths, which are generally used for long-term stability computations, are highly sensitive to the fraction of clay minerals in the material (Lambe and Whitman 1969).

Drnevich et al. (1976) determined properties of crushed rock that simulate the properties of spoil in eastern Kentucky. They obtained angles of internal friction ranging from 28° to 36° and cohesive strengths ranging from 140-400 lb/ft^2.

The need for large-scale testing to incorporate the effects of large rock fragments has often been expressed. Brown and Swanson (1977) used a large, direct shear device to test samples of spoil containing rock fragments up to 3 in. in diameter; their studies show that the effect of the coarse fraction is minor. Studies by Skempton (1964), Kenny (1977), and Shannon and Wilson (1979) suggest that the coarse material has little effect on strength if more than 20-40 percent of the fill is composed of fine-grained material. Rodine and Johnson (1976) have shown that strength parameters depend upon the size distribution as well as the percentage of coarse materials.

8.2.3.3 Pore-Water Pressures Designs of spoil embankments should be based on the worst conditions of saturation and flow of ground water compatible with known field conditions. If the geotechnical engineer expects ground-water conditions to influence the stability of an embankment, the design assumptions should be checked through the use of piezometers installed in the embankment.

8.2.3.4 External Dynamic Forces The effects of blasting and earthquakes can be incorporated into stability analyses by current procedures in geotechnical engineering. For example, horizontal and vertical accelerations resulting from blasting and earthquakes can be added to the acceleration due to gravity.

8.2.4 Discussion of Stability Analyses

Use of the types of stability analyses, site investigations, and soil properties discussed above can result in safe designs of fills. Shannon and Wilson (1979) used these methods to analyze nine failures of mine spoil, using one set of laboratory strength tests for the spoil and one set for the foundation materials at each site. The analyzed factors of safety were generally within about 15 percent of the factor of safety of 1.0, which existed at the times of failure. According to Shannon and Wilson (1979), more thorough sampling and testing should allow the factor of safety to be computed to within 10 percent.

The methods of stability analysis discussed here have been used for many years for the analysis of natural and man-made slopes. These methods were used in the design of several large rock-fill dams, including the 255-ft-high Nantahala Dam built in 1942 by the Aluminum Company of America, the 285-ft-high South Hoston Dam built by the Tennessee Valley Authority (TVA), the 318-ft-high Watauga Dam built by the TVA, and many others. The same expertise in geotechnical engineering and engineering geology that can design a rock-fill structure to hold huge amounts of water, and can account for high pore-water pressures and seepage forces inherent in dams, can design safe, economical, and environmentally sound valley fills.

Another kind of engineering problem associated with the disposal of excess spoil, the prediction of postfailure behavior of spoil, is more difficult to deal with than the problem of designing embankments that have a high factor of safety against sliding. The tendency for some spoil to mobilize and flow for large distances has been responsible for spectacular failures, such as that at Aberfan (see Section 6.3.2 and Working Paper I). Although landsliding of spoil is probably responsible for more long-term damage to the environment by contributing large volumes of sediment to streams and by destroying man-made structures, flows can be catastrophic and can cause loss of human life and property at great distances from their starting point. A serious complication is that designing to prevent landsliding is a relatively well-understood engineering task, whereas the basic mechanisms of flows have received relatively little attention. However, there is considerable evidence that flows originate as landslides. Thus, if sliding can be prevented, so can the flows (Casagrande 1965, Johnson and Rahn 1967, Bishop 1973, Rodine 1974).

8.3 DRAINAGE OF EXCESS SPOIL EMBANKMENTS

Section 816.41 (Hydrologic Balance) of the OSM regulations requires that "Surface mining activities shall be planned and conducted to minimize changes to the prevailing hydrologic balance. . . ." Hydrologic balance is defined in §701.5 as ". . . the relationship between the quality and quantity of water inflow to, water outflow from, and water storage in a hydrologic unit such as drainage basin, aquifer, soil zone, lake or reservoir. It encompasses the dynamic relationships among precipitation, runoff, evaporation, and changes in ground or surface water storage." This concept is closely related to the concept of a hydrological "water budget" and is a small part of the larger concept of the hydrologic cycle.

Hydrologic phenomena are extremely erratic in both time and space (Linsley et al. 1975). Hence averages of hydrologic data tend to be misleading because the average condition is rarely realized. Usually it is the extreme events that are of greatest interest to society in general and to hydrologists in particular. Most hydraulic engineering projects are designed to protect against the adverse effects of the extremes. In large measure, the concerns associated with excess spoil embankments are for those periods of major but infrequent precipitation events, such as a 10-year storm event.

OSM regulations specify that underdrains must be provided for valley fills (§816.72), head-of-hollow fills (§861.73), and durable rock fills (§816.74), whenever the disposal area contains springs, natural or man-made water courses, or wet-weather seeps. The regulations also include provisions (§816.73) for utilizing a rock-core chimney drain instead of the underdrain system.

The durable rock underdrains must be constructed along the natural drainage course and extend the full length of the spoil embankment. Lateral rock drains must be constructed to areas of potential drainage or seeps. A filter system must be used to protect the underdrain from clogging due to sedimentation, although in actual practice such filters are not always used. Not more than 10 percent of the underdrain may be less than 12 in. in size, and no single rock may be larger than 25 percent of the width of the drain. The minimum size of the drain is shown in Table 8.1 below:

TABLE 8.1 Minimum Size of Main Underdrains for Different Amounts and Types of Valley-Fill Material

Total Amount of Fill Material	Predominant Type of Fill Material	Minimum Size of Drain (ft) Width	Height
Less than 1 million cubic yards			
	Sandstone	10	4
	Shale	16	8
More than 1 million cubic yards			
	Sandstone	16	8
	Shale	16	16

SOURCE: Federal Register 1979.

Underdrains must consist of durable materials, such as natural sand and gravel, sandstone, or limestone.

In head-of-hollow fills the rock-core chimney drain may be substituted for the rock underdrain system. In the rock-core chimney system the vertical projection of the main stream channel must be filled with a core of durable rock at least 16 ft wide for the full length and the full height of the fill. A system of lateral rock underdrains must be constructed to connect the rock core with each area of potential drainage or seepage. A filter system is required to ensure that the rock core does not clog due to sedimentation. The rock underdrain and the rock-core chimney are the only two internal drainage systems permitted under the OSM regulations.

Other methods for achieving internal drainage for excess spoil dumps probably deserve investigation and evaluation. One method commonly used in a large segment of the mining industry is end-dump or side-dump fill construction, wherein spoil is dumped in thick lifts (layers of material); 300 ft is not uncommon, and gravity sorting acts to separate the coarse material from the fine, the coarser material going to the bottom. This gravity-sorting process results in a rock blanket across the bottom of the fill and acts as an effective drain with a natural filter throughout the fill. Proper construction, including some rehandling and sorting of materials, is usually important in this procedure to assure the proper functioning of the fill and the drain.

Public sentiment against this method of fill construction runs high, however, probably because of past industry abuses of this method. However, there is no reason to assume that engineered fill embankments of this kind cannot be designed and constructed to meet the prescribed factor of safety of 1.5 in all regions of the country. Some specific sites may be unsuitable, however.

French drains, or rubble drains, have also been successfully constructed by end-dumping, especially where the fine soil fractions can be separated from the loose rock.

Especially in the highway construction industry, embankment drainage is often accomplished through the use of perforated or slotted pipe installed horizontally along the foundation area of the embankment. This method may also be suitable for some of the smaller spoil embankments. Drainage pipe can also be installed after construction by horizontal drilling and installation in the fill. It is doubtful that this method is practical for spoil construction, but it might be useful as a remedial drainage system.

8.4 REVEGETATION OF EXCESS SPOIL

8.4.1 Introduction

Revegetation of mine spoil has long been recognized as an essential part of a successful reclamation program, and much of the earliest legislation regarding coal mine reclamation contained revegetation provisions. Unfortunately, in many cases the belief was that "if it is green, it has been reclaimed." Although it is still agreed that revegetation is a key process in mitigating the social and environmental problems associated with postmining landscapes, it is also recognized that successful revegetation often depends upon other equally important elements, such as diversion design and landform design within the overall reclamation program.

8.4.2 Benefits of Revegetation

Establishment of a vegetative cover on excess spoil embankments is intended to provide six primary benefits: (1) enhancement of infiltration or percolation of surface water, (2) stabilization against wind and water erosion, (3) abatement of air and water pollution, (4) conservation and amelioration of soil, (5) promotion of a beneficial postmining land use, and (6) enhancement of appearance.

Realization of these primary benefits is not universally guaranteed by the successful establishment of a vigorous plant community. Various plant communities are unique in their ability to provide the benefits of revegetation, and if the full benefits of revegetation are to be realized, the structural and functional attributes of alternative communities must be considered. Further, plant communities differ in their tolerance of environmental factors. If prompt, successful revegetation is to be achieved, each plant community's ability to adapt to the spoil embankment environment must also be considered.

8.4.3 Revegetation Practices

Over the past 15-20 years, a vast body of information about coal spoil revegetation has come into existence. Revegetation guides outlining contemporary principles and practices are readily available for many coal mining regions (Frank 1963, Soil Conservation Service 1963, Cook et al. 1974, Aldon and Springfield 1975, Lang et al. 1975). Additionally, hundreds of articles addressing various aspects of coal spoil revegetation have been published. A partial listing of these publications is contained in several bibliographies (Limstrom 1953, Knabe 1958, Funk 1962, Frawley 1971, Loomis 1971, Dalsted and Leistritz 1973, Environmental Protection Agency 1973, Munn 1973, Caldwell 1974, Honkala 1974, Bituminous Coal Research, Inc. 1975, Steen and Berg 1975, Western Regional Coordinating Committee 1975, Czapowsky 1976, Lewis et al. 1976, Follett 1980).

The fundamental principle behind contemporary revegetation practices is that surface mining activities should be conducted in a manner that preserves and enhances environmental and other values. Accordingly, the goals of current revegetation practices are manifold, including contemporaneous reclamation; recovery of premining productivity levels; promotion of ecologically sound land uses; protection of fish and wildlife habitat; protection of air and water resources; soil conservation.

Goal-oriented revegetation requires special planning. Practices compatible with multiple goals must be coordinated to provide an efficient and economic revegegation program. Most importantly, revegetation planning must occur prior to fill construction if the most effective revegetation program is to result.

Critical planning questions in the revegetation process include the following:

- What is the postmining land use for this site?
- What are the best handling procedures for conserving topsoil, or for identifying and conserving the best available substitute?
- How can toxic or acidic spoils be most efficiently managed?
- How will surface water be diverted from the fill?
- What backfilling and grading operations will be required?
- What is to be the final configuration of the fill?

The OSM regulatory program generally reflects the state of the art in revegetation practice. The regulations require the establishment of an effective, diverse, and permanent vegetative cover of native plants or plants which support an approved postmining land use. Further, revegetation practices are to be carried out in a manner that minimizes erosion and promotes the prompt recovery of premining productivity levels. The time frame involved varies primarily with average annual precipitation and the length of the growing season. Ordinarily, a high degree of erosion protection should be provided at the end of the first growing season; restoration of productivity takes somewhat longer.

The use of grass as the primary revegetation medium seems unavoidable. Grass will provide areal cover, more organic matter, and soil-holding by the root system faster than either shrubs or trees. The contribution of organic matter to the spoil is of crucial importance to increased soil-water holding capacity and increased cation exchange capacity. These effects are requisite to building soil from spoil. Many introduced pasture grasses have been genetically improved to provide forage (cover) and response to fertilizer. They will outproduce the native grasses in both speed of development and root and shoot production. But they are also heavy water users and have other disadvantages. Therefore the best mix probably will contain both introduced and native grass species. Insistence upon the use of native species alone usually slows the recovery of mined lands.

To the extent that the objectives of revegetation are met, future alternatives for land use are also preserved. Once a waste dump is stabilized, it will exist for a very long time. If the waste dump has a favorable soil, the native species will invade the area and plant succession will be initiated at a high level in the continuum. On the other hand, an active role, such as planting trees, can be undertaken where postmining land use renders such action appropriate.

It is difficult to generalize about differences between past and present revegetation practices. This is due to the lack of uniformity of past practice, which tended to vary with mining methods, regulatory constraints, and environmental setting. However, a report of the Council on Environmental Quality (1973) does provide an assessment of past reclamation technology, and the following observations are pertinent here:

- The principles and techniques of contemporary practice were developed years ago, and these were generally available for past practice. Elements of past practice included topsoil removal and storage, grading and backfilling, spreading topsoil or spoil amendment, seeding or planting, mulching and follow-up.
- Best practices were not universally applied, particularly with respect to topsoil conservation.
- Lack of integration of mining and reclamation activities often inhibited application of the best practices.
- Disregard of land use prior to and after mining often limited the potential benefits of revegetation.

Although the revegetation technology of the past was not substantially different from that of the present, there were only limited instances where the best available technology was used. Perhaps the most consequential omission of available technology was the failure to conserve topsoil. Direct revegetation of coal spoil is generally more difficult than revegetation of topsoil. Further, coal spoil is more erosive than topsoil and is prone to the production of toxic drainage. Plant communities established in coal spoil also tend to be less productive than similar communities planted in topsoil.

Prior to 1970, revegetation practice and reclamation in general involved little planning in advance of mining. Revegetation and reclamation were considered a separate activity from mining, and this inhibited the proper integration of the two operations. Fill construction was often completed without regard to such considerations as spoil management and landform. Further, revegetation practices did not generally involve explicit consideration of the use of the land prior to mining or its intended use after mining.

As a result of poor planning, postmining landscapes of the past were often of little value to society. Revegetation practices were necessarily oriented toward controlling erosion, sediment, and toxic drainage associated with ill-conceived landforms. This emphasis probably contributed to the confusion between the concepts of revegetation and reclamation, and limited the potential benefits of revegetation.

Compared with revegetation practices of the past, contemporary practices are most successful in attaining the primary benefits of revegetation. This difference is primarily related to changes in regulatory requirements and performance standards; public enlightenment concerning environmental ethics; advent of comprehensive land-use planning; resource conservation policies; mining industry recognition of environmental responsibilities; and experience.

8.4.4 Criteria for Successful Revegetation

Criteria for determining the success of revegetation usually involve performance standards regarding ground cover, productivity, plant vigor and condition, species composition, species diversity, and stocking of woody plants.

Generally, these performance standards are goal-oriented and relate to those characteristics of vegetation that affect (1) the control of erosion, sediment, and toxic drainage, and (2) the support of a specified land use.

Two regulatory approaches are common. In the past, usual practice involved the specification of a single performance standard for ground cover, productivity, and related characteristics of vegetation. For example, a regulation might specify that legumes and grasses must provide at least 80 percent of the ground cover. A more recent approach involves the comparison of vegetation characteristics on the disturbed site with an undisturbed reference area of similar land use. For example, a regulatory code might specify that ground cover on the disturbed site must equal ground cover on an approved reference area. The latter approach is intended to provide a more flexible standard that is sensitive to natural (spatial and temporal) variation in vegetation and alternative land use. Unfortunately, it is often perceived as being a more cumbersome and confusing regulatory approach.

Contemporary revegetation performance standards often involve time constraints. Successful revegetation, as defined by various standards, must be achieved in a certain time period. Further, vegetation must be able to meet performance standards over some extended period of time in the absence of artificial maintenance. The objectives of such time constraints are twofold: (1) to ensure rapid stabilization, and (2) to ensure permanent vegetative cover. In some instances, it is also necessary to demonstrate the ability of the established vegetation to be naturally succeeded by native flora.

Unfortunately, such time constraints also inhibit more rapid development of spoil edaphic properties by discouraging "artificial maintenance" practices (e.g., augmented seeding, fertilization, or irrigation). Present bonding regulations (§805.13) provide that the period of liability begins with the last year of such management inputs. Thus, operators are inclined to use too little fertilizer, too infrequently. Consequently, organic matter is not provided to the spoil in such quantities nor as rapidly as is desirable and possible.

The OSM regulatory program contains rigorous standards for successful revegetation. Although fixed standards or reference areas may be used for comparison purposes, the rules require a demonstration of ground cover persistence and productivity. Where postmining land use involves the planting of trees and shrubs, stocking standards for woody plants are also specified.

8.5 RELATED CONSTRUCTION METHODS AND PRACTICES

Civil engineering practice includes construction background and techniques that can be called upon to assist in the construction of safe, stable, environmentally acceptable fill structures. There are similarities between head-of-hollow and valley fills and highway and dam construction. The similarities are most noticeable in highway construction spoil disposal, highway embankment construction, and rock-fill dam construction.

The Department of the Interior (1978) report, Development of New Design Concepts for Construction of Valley Fills, contains a thorough discussion of these related construction practices.

8.5.1 Highway Construction Spoil Disposal

Spoil disposal sites as designed and constructed by the highway construction industry, and generally termed "waste sites," usually take the form of head-of-hollow or valley fills where topography of the sites is similar to that found in steep-slope surface mining.

Prior to use as a waste site, states generally require approval by the Department of Highways. Requirements for approval vary from state to state but usually require submission of data and drawings showing original topography and planned elevations of structure, configuration of fill, plans for drainage and control of erosion, plans for sedimentation basin, description of fill materials, and plans for revegetation.

The details of design and construction as proposed by the builder must be approved by the resident engineer, but design responsibility rests with the builder's engineer.

8.5.2 Rock-fill Dam Construction

The durable rock-fill alternative of §816.74 of the permanent regulations for the disposal of excess spoil is based on several decades of rock-fill dam construction experience, which provides a considerable volume of information directly supporting the practice of side- or end-dumping of rock in various types of structures. There are numerous rock-fill dams that were constructed by side- or end-dumping methods. Examples include the Salt Springs Dam in northern California, constructed with a main end-dump lift of 185 ft, the Dix Dam in central Kentucky with side-dump lifts of 120 ft, and the Brown Lee Dam on the Snake River with lifts in excess of 50 ft (Dials 1978). Casagrande and Casagrande (A. Casagrande and D.R. Casagrande, written communication to T.J. Sawarynski, October, 1978) also point to the Cogswell Dam in southern California as an example of a rock-fill dam, a 280-ft-high structure with a thin concrete facing, which was built by dry-dumping in 25-ft lifts. They noted that dump rock fills are commonly placed in lifts ranging from 50-150 ft. It was also their belief that the practice of dumping spoil from the bench into a hollow was quite satisfactory because it allowed the coarse materials to be deposited at the bottom to serve as French drains.

Experience in constructing rock-fill dams suggests that it is appropriate to use end- and side-dumping methods for spoil disposal in head-of-hollow fills and other durable rock fills. According to Terzaghi and Peck (1967), not only can stable fills be constructed by end-dumping methods, but such fills permit more economical coal production from strip mining operations. Side-dumping is also effective in spoil disposal. Terzaghi and Peck (1967) note that where the spoil material is made up of more than 65 percent sandstone, it can be side-dumped and need not be compacted; however, it should be worked in level benches at the end of each shift. Where the material is less than 65 percent sandstone, it can be side-dumped but should be picked up at the bottom of the dump point, placed on the fill bench in 4-ft layers, and compacted. In steep terrain where the overburden is more than 90 percent sandstone, the underdrain system can be constructed through natural segregation by side-dumping.

With respect to the stability of rock-fill structures consisting of hard-rock spoil material, the safety factor of the completed structure (assuming the steepest outslope above 1v:2h, as proposed by the rules) will not be less than 1.5 and probably will be much greater (Dials 1978). However, it is not possible, according to the Department of the Interior (1978), to make a direct correlation between rock-fill dam construction and head-of-hollow fill construction because of the wide differences in the safety factor applicability (emphasis added). A head-of-hollow fill may slide without causing significant damage, whereas the collapse of a dam is very likely to cause substantial damage.

Although there is general applicability of rock-fill dam construction practices to the disposal of excess spoil, details of actual construction practices may differ. The reason for this is in the design requirements of different structures. Rock-fill dams must be designed so that ground settlement is strictly controlled to prevent damage to membranes used to stop seepage, whereas durable rock fills do not have this limitation on ground settlement because impervious membranes are not required, nor are the structures required to hold back any water. Even though rock-fill dams are rarely built today because of potentially damaging differential settlement that occurs as a reservoir fills up (Dials 1978), the methods used in their construction are appropriately considered for spoil disposal because differential ground settlement is not a problem. For durable rock fills constructed of hard rock, most of the settlement occurs as soon as the load is applied, whether the fill is constructed in layers or is dumped. In spoil materials there will be no significant settlement of the surface subsequent to the completion of the fill.

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Appendix A

COST DATA AND TECHNICAL INFORMATION SUPPLIED BY INDUSTRY

In pursuing its broad objective of reviewing engineering practices and environmental conditions affecting the disposal of excess spoil and of assessing the regulatory standards applicable to excess spoil disposal, the Committee on the Disposal of Excess Spoil felt it would be useful to have cost figures and technical information based on actual experience in constructing head-of-hollow and valley fills. The Committee requested the National Coal Association and the American Mining Congress to contact member companies for cost and related information, which was returned to the Committee without company identification, in order to maintain the integrity of the proprietary information. In an attempt to obtain comparable data the Committee indicated specific operations for which cost information was to be submitted. Data were provided on costs incurred under practices required to meet OSM regulations as well as on practices judged by industry to be sufficiently rigorous to meet reasonable reclamation standards. The Committee, however, did not evaluate the alternative engineering practices as to their appropriateness for meeting regulatory standards. Cost data used by the Committee are presented here directly as submitted by individual companies.

Technical information was also requested on methods of fill construction, size of fill, equipment used, and on other aspects of a company's excess spoil disposal operation. It was expected that supplemental technical information would provide a further understanding of the cost data. Although the small sample of data may not be representative of the range of industry costs and practices for disposing of excess spoil, a general assessment of costs resulting from adherence to OSM regulations and for projected costs resulting from adherence to alternative good engineering practices emerged from the information submitted. These data are presented below for four companies. The cost data for a specific company are first listed, and

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Note: Some cost data and technical information submitted by companies were not used by the Committee in its summary discussion. However, these data are available for inspection, and photocopies are available through the NAS archivist upon payment of appropriate charges (xeroxing, postage, and handling).

the technical aspects of the company's excess spoil disposal operation are then discussed. Companies were also asked to comment on major problems concerning excess spoil disposal regulations apart from costs for specific operations.

COMPANY A

Cost Data

Cost data for specific operations of Company A in disposing of excess spoil and reclaiming the mined area are given in Table A-1. According to the company, the total cost of spoil disposal and reclamation under practices required to meet OSM regulations is nearly 3 1/2 times the cost of using alternative good engineering practices. Road construction and spoil haulage costs are major contributors to the significantly higher total costs under OSM regulations.

Technical Information

The following information accompanies the cost data on excess spoil disposal operations shown in Table A-1.

1. Mining method. This is a valley fill with a rock-core chimney. It is constructed by (1) building a pond below the fill with a sediment storage capacity 0.125 acre-feet for each acre on the face of the fill, (2) clearing the area of all vegetation (can be done in progressive stages), (3) building a road down through the area to be filled to the toe (road must meet construction standards), (4) constructing a rock toe, (5) building the fill up in 4-ft lifts with a 50 percent slope on the face and 20-ft-wide benches every 50 vertical feet, (6) sloping these benches to rock-core drain that is at least 16 ft wide and 2 ft below the level of the fill, (7) maintaining a drainage pocket at the back of the fill for the top surface to drain into during construction, (8) spreading topsoil and seeding face as built (this is done by removing topsoil in front of fill as fill comes up and dumping over the face where it is spread and prepared for seeding), and (9) seeding top and face of fill.

2. Size of fill. The specific fill used in this evaluation is now up about 250 ft. When completed, it will be 450 ft high, contain approximately 3.3 million yd^3, and cover 24 acres.

3. Equipment and manpower used. The numbers in parentheses refer to numbers under item 1 above.

(1) One D-9 dozer.
(2) By contract.
(3) One D-9 dozer, one drill, one 10-yd loader.
(4) One 85-ton rock hauler, one D-9 dozer.
(5), (6), (7), (8) D-8 dozer, 5-yd loader, (topsoil), four to six 85-ton rock haulers (six in early stages of fill); occasional

TABLE A-1 Company A Cost Data for Disposal of Excess Spoil*

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd^3 or acre**	$ total	$ per yd^3 or acre	$ total
1. ENGINEERING COSTS				
a) Investigation		1,000		1,000
b) Testing		2,000		5,000
c) Design		2,000		2,000
d) Inspection and certification		3,000		3,000
e) Stability analyses				10,000
2. SITE PREPARATION				
a) Removal of vegetation	1,600/acre	38,400	1,600/acre	38,400
b) Removal of topsoil and organic matter	400/acre	10,000	Not removed	
c) Construction of keeway cuts or rock toe buttresses		1,000		3,000
3. ROAD CONSTRUCTION**	35.27/ft	130,500 for 3,700/ft		
4. CONSTRUCTION OF ROCK UNDER-DRAINS AND FILTERS OR CHIMNEY DRAINS		5,000		5,000
5. CONSTRUCTION OF DIVERSION CHANNELS FOR SURFACE RUNOFF	Not done			15,000
6. DRILLING AND BLASTING OPERATIONS				

TABLE A-1 Company A Cost Data for Disposal of Excess Spoil* (Continued)

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre**	$ total	$ per yd3 or acre	$ total
7. HAULAGE OF SPOIL	$0.46/yd^3$	1,513,100	$0.09/yd^3$	298,000
8. SPOIL SPREADING AND COMPACTION	$0.06/yd^3$	192,000	$0.03/yd^3$	96,000
9. CONSTRUCTION OF TERRACES FOR EROSION CONTROL AND STABILITY		8,800		39,120
10. COVERING, GRADING, TOPSOILING AND SEED PREPARATION	600/acre	14,400	1,200/acre	28,800
11. REVEGETATION	390/acre	9,360	390/acre	9,360
12. OTHER (PLEASE SPECIFY) Pond Construction		15,000		15,000
13. GRAND TOTAL		1,945,560		568,680

*The following assumptions were made in the development of the data:

1) All costs are adjusted to reflect July 1, 1980 dollars.
2) All costs reflect requirements of the OSM permanent program regulations (unamended and without regard to the actions of the courts in remanding, enjoining or overturning them).
3) Costs estimated for alternative construction methods are based upon best engineering estimates.
4) General overhead costs are factored into the individual cost factor items.
5) Sites selected for analysis were typical sites without special problems which would tend to skew the cost figures.

**Road construction (item #3) is given in $/ft.

SOURCE: Data provided through the National Coal Association and American Mining Congress, 1981.

D-9 to assist on slope; this does not include equipment to load rock haulers at pit.
(9) By contract, using hydroseeder.

4. Physical, chemical, and geotechnical properties of the soil. The surface horizons of native soils are strongly acid and have lime requirements from 2.4 to 4.4 tons per 1000 tons, low calcium throughout, generally low phosphorus, low to high potassium, and low to high magnesium. Subsoil and upper-horizon weathered rocks give similar tests, except the magnesium is higher in the subsoils and substrata. Only a few thin layers of overburden are capable of forming acidity, whereas an overwhelming proportion of overburden contains an excess of neutralizing capacity.

5. Description of the disposal site topography, natural slope angles, hydrologic conditions, underlying rock types (physical, chemical, and geotechnical properties), and climatic conditions (annual precipitation). The site is a hollow approximately 1600 ft in length, with natural slopes ranging from 20 percent at toe to an average of 47 percent at head of fill. The underlying rock types are predominantly sandstone (84 percent) and shale. The first significant aquifer and the water table are at the level of the _________ Seam, well below the _______ level being mined at this area. The average annual precipitation is approximately 44 in.

6. Description of the construction method used in the sound engineering alternative. This is a single-lift valley fill using gravity segregation. (1) Construct pond below fill, (2) clear area of vegetation (done in progressive stages), (3) construct rock toe and buttress, (4) construct fill by dumping from end, which keeps large rocks in crotch where the fill contacts natural ground as the fill is built out with fill sloped to drain to crotch on each side, (5) shape face of fill on 50 percent slope with 20-ft benches every 50 vertical feet with benches sloped to crotch, and (6) construct permanent diversions on each side of fill. Major savings is related to reduced haulage time, fuel consumption, and haulage equipment. Road construction is also a major savings.

Major Problems Other Than Costs for Specific Operations

1. Current regulations make it cheaper to backstack than to haul down into the valley fill. This greatly reduces the amount of flat land created in mountaintop operations.

2. Haulage with heavy trucks down steep roads is a constant safety hazard, particularly in winter and wet weather. The operation must be laid out so that primarily backstack areas are available in winter, with little use of valley fills. This affects mine planning and thus costs in a way that is difficult to quantify.

3. The variable number of trucks required makes it difficult to utilize all equipment efficiently and still maintain a constant rate of overburden removal, which is essential to maintain a constant production rate. This, coupled with road construction requirements, means that

coal production is invariably down during early stages of a new valley fill.

COMPANY B

Cost Data

Cost data were submitted by Company B for two different fill structures and reclamation operations, as shown in Tables A-2 and A-3. In each case the total costs of spoil disposal and reclamation were not greatly different under practices required to meet OSM regulations and under alternative good engineering practices. However, costs of specific operations differed, in some cases favoring practices under OSM regulations, in others under alternative good engineering practices.

Technical Information, Fill No. 1

1. Method of mining and method of fill construction. Mountaintop removal is used, generally following the cross-ridge direction of mining, with excess spoil disposal in a combination of head-of-hollow fills and backstacks.

This valley fill was constructed by using a combination of end-dump with rehandle (under early regulatory rules) and hauldown (under current regulatory rules). A 16-ft-wide rock-core chimney drain of minimum 12 in. by 12 in. rocks was built the full depth of the fill. All rehandle and hauldown materials were placed in 4-ft layers and compacted by the hauling and placing equipment. It is estimated that one fourth of the fill volume was placed by end-dumping and was not rehandled.

2. Size of fill. Total volume of 10,460,000 yd^3, with 2:1 front slopes, 50-ft vertical rises, and 20-ft terraces. Bottom lift contains 35,000 yd^3, and top lift contains 1,808,000 yd^3. Total height, 500 ft.

3. Equipment and manpower used. The typical hauling operation was during each of two shifts per day and utilized eight RX 105 Euclid 105 ton end-dump trucks (dozers and stripping shovels for loading operation not included in this estimate). Typical rehandle operation was for one shift per day and utilized one Caterpillar 992 10 CY loader, two R-50 Euclid 50-ton end-dump trucks, and one D-8 Caterpillar dozer. Total daily manpower was typically 25 man-shifts including supervision. (Rehandle operation included work on terraces and seed-bed preparation, etc.)

4. Properties of the soil. Typical overburden consists of the following:

112 ft of sandstone

pH--7.09 to 5.32
Fizz rating--strong to none
Iron--2.1 to 2.9 mg/l

TABLE A-2 Company B Cost Data for Disposal of Excess Spoil--Fill No. 1*

COST FACTORS Total fill volume = 10,460,000 yd^3	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre	$ total	$ per yd3 or acre	$ total
1. ENGINEERING COSTS		90,000		80,000
a) Investigation				
b) Testing				
c) Design				
d) Inspection and certification				
e) Stability analyses				
2. SITE PREPARATION	1,400/acre	75,600	400/acre	21,600
a) Removal of vegetation				
b) Removal of topsoil and organic matter				
c) Construction of keeway cuts or rock toe buttresses				
3. ROAD CONSTRUCTION (all per-yd^3 prices based on total fill volume)	0.0324/yd^3	338,900	0.0324/yd^3	338,900
4. CONSTRUCTION OF ROCK UNDER-DRAINS AND FILTERS OR CHIMNEY DRAINS	0.006[illegible]/yd^3	66,000		0
5. CONSTRUCTION OF DIVERSION CHANNELS FOR SURFACE RUNOFF		0	0.0021/yd^3	22,000
6. DRILLING AND BLASTING OPERATIONS		1,834,900	0.1754/yd^3	1,834,900

TABLE A-2 Company B Cost Data for Disposal of Excess Spoil--Fill No. 1* (Continued)

COST FACTORS Total fill volume = 10,460,000 yd^3	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd^3 or acre	$ total	$ per yd^3 or acre	$ total
7. HAULAGE OF SPOIL (all per-yd^3 prices based on total fill volume)	0.3022/yd^3	3,161,000	0.3022/yd^3	3,161,000
8. SPOIL SPREADING AND COMPACTION	0.1038/yd^3	1,085,700	0.3343/yd^3	568,300
9. CONSTRUCTION OF TERRACES FOR EROSION CONTROL AND STABILITY	0.0021/yd^3	22,000	0.0021/yd^3	22,000
10. COVERING, GRADING, TOPSOILING AND SEED PREPARATION	0.0088/yd^3	92,500	0.0088/yd^3	92,500
11. REVEGETATION	1,500/acre	79,500	1,500/acre	79,500
12. OTHER (PLEASE SPECIFY)				
13. GRAND TOTAL		6,846,100		6,220,700

*The following assumptions were made in the development of the data:

1) All costs are adjusted to reflect July 1, 1980 dollars.
2) All costs reflect requirements of the OSM permanent program regulations (unamended and without regard to the actions of the courts in remanding, enjoining or overturning them).
3) Costs estimated for alternative construction methods are based upon best engineering estimates.
4) General overhead costs are factored into the individual cost factor items.
5) Sites selected for analysis were typical sites without special problems which would tend to skew the cost figures.

SOURCE: Data provided through the National Coal Association and American Mining Congress, 1981.

TABLE A-3 Company B Cost Data for Disposal of Excess Spoil--Fill No. 2

COST FACTORS Total fill volume = 6,800,000 yd^3	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre	$ total	$ per yd3 or acre	$ total
1. ENGINEERING COSTS		100,000		80,000
a) Investigation				
b) Testing				
c) Design				
d) Inspection and certification				
e) Stability analyses				
2. SITE PREPARATION	1,400/acre	79,700	400/acre	22,800
a) Removal of vegetation				
b) Removal of topsoil and organic matter				
c) Construction of keeway cuts or rock toe buttresses				
3. ROAD CONSTRUCTION (all per-yd^3 prices based on total fill volume	$0.0404/yd^3$	274,600	$0.0324/yd^3$	220,400
4. CONSTRUCTION OF ROCK UNDER-DRAINS AND FILTERS OR CHIMNEY DRAINS	$0.0063/yd^3$	42,900		
5. CONSTRUCTION OF DIVERSION CHANNELS FOR SURFACE RUNOFF		0	$0.0021/yd^3$	14,300
6. DRILLING AND BLASTING OPERATIONS	$0.1754/yd^3$	1,192,700	$0.1754/yd^3$	1,192,700

TABLE A-3 Company B Cost Data for Disposal of Excess Spoil--Fill No. 2 (Continued)

COST FACTORS Total fill volume = 6,800,000 yd^3	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre	$ total	$ per yd3 or acre	$ total
7. HAULAGE OF SPOIL (all per-yd^3 prices based on total fill volume)	0.5343/yd^3	3,633,200	0.3796/yd^3	2,581,300
8. SPOIL SPREADING AND COMPACTION	0.0421/yd^3	286,300	0.1166/yd^3	792,900
9. CONSTRUCTION OF TERRACES FOR EROSION CONTROL AND STABILITY	0.0034/yd^3	22,900	0.0034/yd^3	22,900
10. COVERING, GRADING, TOPSOILING AND SEED PREPARATION	0.0137	93,100	0.0137/yd^3	93,100
11. REVEGETATION	1,500/acre	79,500	1,500/acre	79,500
12. OTHER (PLEASE SPECIFY)				
13. GRAND TOTAL		5,804,900		5,099,900

*The following assumptions were made in the development of the data:

1) All costs are adjusted to reflect July 1, 1980 dollars.
2) All costs reflect requirements of the OSM permanent program regulations (unamended and without regard to the actions of the courts in remanding, enjoining or overturning them).
3) Costs estimated for alternative construction methods are based upon best engineering estimates.
4) General overhead costs are factored into the individual cost factor items.
5) Sites selected for analysis were typical sites without special problems which would tend to skew the cost figures.

SOURCE: Data provided through the National Coal Association and American Mining Congress, 1981.

Sulfur--none
Lime requirement--0 to 0.2 tons/1000 tons of material

40 ft of hard sandy shale

pH--6.29
Fizz rating--none
Iron--0.68 mg/l
Sulfur--none
Lime requirements--0.05 tons/1000 tons of material

12 in. of topsoil (range zero to 24 in.)

pH--2.73
Fizz rating--none
Iron--2.89 mg/l
Sulfur--none
Lime requirements--0.73 tons/1000 tons of material

5. Description of the disposal site. The local topography is one of excessively steep slopes and narrow valleys, with a maximum relief of approximately 1500 ft.

This valley-fill site has side slopes of 30°. There are no springs within the fill area. The annual precipitation is approximately 45 in. Underlying rock types are as noted in item 4 above.

6. Sound engineering alternative. The alternate construction scheme estimated for valley fill is the sound engineering practice of end-dumping with selected sandstone only (in a volume of not less than 80 percent) and in sizes to provide a coarse rock drainage blanket at the interface with the site to a depth of at least 8 ft.

Rehandle is not commenced until the toe of the end-dump is within easy dozer-push distance from the planned toe location of the valley fill. At that time a short rock keyway cut is made and filled, and the first 2:1 front face slope is begun in the direction of the first 20-ft terrace to be placed 50 ft above the toe elevation. Abutment drainage channels are constructed where the final fill meets undisturbed hillside as the lifts are raised. It is estimated that 15 percent of the valley-fill volume will be rehandled in this scheme.

Major Problems Apart from Costs, Fill No. 1

Hauldown operations on our roads into the valley fill are hampered during wet weather because the trucks cannot safely and efficiently traverse the steep grades.

We have already had occasion to backstack certain amounts of fill that were intended for inclusion in a valley fill because of the difficulty of continuously using a hauldown-type fill. This has had the effect of breaking up the large, flat mountaintop areas that were originally planned for wide-open alternate land uses. Our current feeling is that we will do whatever possible to avoid building another rock-core chimney drain fill.

We have noticed a propensity on the part of state and federal government (OSM) representatives to advocate the disturbance of stable, existing ground surface for the purpose of clearing and grubbing, topsoil removal, and even topsoil acquisition for use elsewhere. Unless there are known water problems, etc., at a valley-fill site, it is our feeling that early surface disturbances (topsoil) should be kept to an absolute minimum. If for no other reason, this is a good idea because a period of years elapses after disturbance and before the final fill cover is in place, during which time increased sediment is continuously liable to leave the area.

Technical Information, Fill No. 2

1. Method of mining and method of fill construction. Mountaintop removal is used, generally following the cross-ridge direction of mining, with excess spoil disposal in a combination of head-of-hollow fills and backstacks.

This valley fill is being contructed under an engineering research grant from the ____________________ (work performed by a private consultant) and variances in procedure granted by state authorities. The Office of Surface Mining has concurred in these variances.

As of December 1, 1980, it is estimated that one tenth of the volume of this fill is in place. All mature trees were removed from the fill area prior to commencement of dumping. No grubbing, brush removal, or topsoil removal was undertaken. End-dumping was begun at the head of the hollow and from the ultimate top level of the fill, using only durable sandstone in run-of-the-mine sizes. The fill is being progressed down the center of the valley in a top width of approximately 100 ft. As this road surface proceeds, a maximum grade of 8 percent will be worked into it in order to reduce the height of the fill as much as possible as the toe location is approached. A prime requirement of the end-dumping variance is that a natural "drainage blanket" of 8 ft of large sandstone rocks (90 percent larger than 12-in. diameter) will be created through natural segregation along the entire area of the interface between the fill and the undisturbed ground. There has been no difficulty in providing the drainage blanket.

It is anticipated that dumping from the side of the jetty-like construction road will be commenced at such time as rehandle work occupies the fill toe area during the day-shift hours. A keyway cut will be made at the extreme toe location as soon as the toe of the untouched end-dumped fill approaches within easy dozer-push distance and when the optimum dumped fill (now estimated as 15 percent of the entire fill) is in a location above and beyond the required final front-slope configuration. In other words, it is hoped that a perfect balance of volumes can be experienced between end-dumped volume outside of the final fill design lines and fill necessary to form the initial slopes and terraces as the ultimate toe area is crowded by the angle of repose fill. It is anticipated that all rehandle work will be done with dozers working the first (daytime) shift. Additional fill required in the side-slope areas will then be deposited during the second daily shift. Topsoil will be gleaned from side-slope areas yet to be covered wherever possible, and will be supplemented with proven sandstone soil substitute. As the lifts and terraces are constructed upward from the final toe location, the variances require that abutment drainage channels be constructed in undisturbed ground at the sloping interfaces on both sides. (It is felt by the operator that a much more satisfactory and durable arrangement could be made by riprapped channels formed into the edge of the fill itself.) The terraces will slope outward at 3 to 5 percent from the fill center to these drainage channels. The top surface of the completed fill will be sloped back from the face 3 to 5 percent toward the mountaintop drainage system. A final factor of safety for stability of 1.5 will be maintained.

2. Size of fill. Total volume of 6,800,000 yd^3, with 2:1 front slopes, 50-ft vertical lifts, and 20-ft terraces. Height of fill is 540 ft, length is 2180 ft, and effective ground slope is 10°. The extreme width at the surface is 1250 ft.

3. Equipment and manpower used

Hauling Operation (two shifts per day).

Three RX 105 Euclid 105-ton end-dump trucks.
One D-9 Caterpillar dozer.
(Loading operations not included in this estimate.)

Rehandle and Sloping Operation (one shift per day)

Two D-9 Caterpillar dozers.
One 992 Caterpillar 10 CY loader.
(Seed-bed preparation included.)

Total Daily Manpower--15 man-shifts, including supervision

4. Properties of the soil. Typical overburden consists of the following:

112 ft of sandstone

pH--7.09 to 5.32
Fizz rating--strong to none
Iron--2.1 to 2.9 mg/l
Sulfur--none
Lime requirement--0 to 0.2 tons/1000 tons of material

40 ft of hard sandy shale

pH--6.29
Fizz rating--none
Iron--0.68 mg/l
Sulfur--none
Lime requirements--0.05 tons/1000 tons of material

12 in. of topsoil (range zero to 24 in.)

pH--3.73
Fizz rating--none
Iron--2.89 mg/l
Sulfur--none
Lime requirements--0.73 tons/1000 tons of material

5. Description of the disposal site. Local topography is one of excessively steep slopes and narrow valleys, with a maximum relief of approximately 1500 ft.

This valley-fill site has side slopes of 30°. There are no springs within the fill area. The annual precipitation is approximately 45 in. Underlying rock types are as noted in item 4 above.

6. Engineering alternative. The valley-fill described above is believed to be nearly the best sound engineering practice that could be used at this mine. Providing that the 1.5 factor of safety could be maintained, it would, of course, be helpful for operations if the 80 percent sound sandstone rule could be relieved to allow inclusion of the various minority shales that occur at this site. Then, too, it would be strongly urged that the interface abutment drainage channels not be cut into undisturbed ground, but rather be constructed with good sandstone riprap as part of the fill. The estimated cost of the fill described above if it were constructed under present OSM requirements is contained in Table A-3.

Major Problems Apart from Costs, Fill No. 2

Hauldown operations on our roads into the valley fill are hampered during wet weather because the trucks cannot safely and efficiently traverse the steep grades.

We have already had occasion to backstack certain amounts of fill that were intended for inclusion in a valley fill because of the difficulty of continuously using a hauldown-type fill. This has had the effect of breaking up the large, flat mountaintop areas that were originally planned for wide-open alternate land uses. Our current feeling is that we will do whatever possible to avoid building another rock-core chimney drain fill.

We have noticed a propensity on the part of state and federal government (OSM) representatives to advocate the disturbance of stable, existing ground surface for the purpose of clearing and grubbing, topsoil removal, and even topsoil acquisition for use elsewhere. Unless there are known water problems, etc., at a valley-fill site, it is our feeling that early surface disturbances (topsoil) should be kept to an absolute minimum. If for no other reason, this is a good idea because a period of years elapses after disturbance and before the final fill cover is in place, during which time increased sediment is continuously liable to leave the area.

COMPANY C

Cost Data

Cost data for Company C are presented in Table A-4. The substantial increase in total costs in order to conform with OSM requirements is a result primarily of higher costs of vegetation removal, removal of topsoil and organic matter, road construction, construction of drains, and spreading and compaction of spoil.

Technical Information

The following information accompanies the cost data on excess spoil disposal operations found in Table A-4.

1. Mining method and disposal method pursuant to OSM requirments. Mining is conducted by mountaintop removal operations. Excess overburden is hauled by trucks to the valley fill where it is dumped and spread by dozer into required 4-ft lifts of 4-ft maximum thickness. Current valley-fill construction is based on rock chimney core as required by the state regulations.

2. Size of fill. The valley fill that is the subject of this study contains approximately 9,800,000 yd^3 of spoil and is in a valley approximately 2500 ft long with a maximum height of fill of approximately 275 ft.

3. Equipment and manpower used. The principal means of loading and hauling is by use of Caterpillar 992C loaders with Caterpillar 777 haulers.

4. Physical, chemical, and geotechnical properties of the soil. No information provided.

5. Description of the disposal site topography, natural slope angles, hydrologic conditions, underlying rock types (physical, chemical, and geotechnical properties) and climatic conditions (annual precipitation). The disposal site lies within the Appalachian Plateau and is a well-defined valley with side slopes of about 30°. The stream course along the valley has a slope of about 4° in its lower reaches and 10° nearer to head of the valley. The area is situated along an anticline, with a dip of approximately 2° across the area. The upper overburden is a massive sandstone, while the lower coal seam lies within a shale horizon.

   Precipitation for the calendar year 1979 was approximately 59 in. It is not known whether this precipitation represents an average figure.

   From an engineering point of view, the sandstones are generally considered competent material and the area is considered geologically stable.

6. Description of the construction method used in sound engineering alternative. The proposed engineered alternative to the current regulation provides for construction of a sediment control pond downstream from the toe of the fill to be designed and constructed in accordance with current regulations. The first-stage operation for

TABLE A-4 Company C Cost Data for Disposal of Excess Spoil*

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd^3 or acre	$ total	$ per yd^3 or acre	$ total
1. ENGINEERING COSTS				
a) Investigation	Lump sum	10,000		10,000
b) Testing				
c) Design		15,000		20,000
d) Inspection and certification		5,000		5,000
e) Stability analyses		1,000		1,500
2. SITE PREPARATION				
a) Removal of vegetation	2,000/acre	124,000		
b) Removal of topsoil and organic matter	5,808/acre	360,096		
c) Construction of keeway cuts or rock toe buttresses				
3. ROAD CONSTRUCTION	2/yd^3	567,500	1.40/yd^3	270,130
4. CONSTRUCTION OF ROCK UNDER-DRAINS AND FILTERS OR CHIMNEY DRAINS	0.80/yd^3	160,000		
5. CONSTRUCTION OF DIVERSION CHANNELS FOR SURFACE RUNOFF			2,000 LF @ $16/LF	32,000
6. DRILLING AND BLASTING OPERATIONS				

TABLE A-4 (Continued)

7. HAULAGE OF SPOIL	0.521/yd^3	3,935,288	0.414/BCY	3,128,924
8. SPOIL SPREADING AND COMPACTION	0.164/yd^3	1,238,200	0.082/BCY	619,100
9. CONSTRUCTION OF TERRACES FOR EROSION CONTROL AND STABILITY			0.620/yd^3	450,200
10. COVERING, GRADING, TOPSOILING AND SEED PREPARATION		Common		Common
11. REVEGETATION		Common		Common
12. OTHER (PLEASE SPECIFY)				
13. GRAND TOTAL		6,421,084		4,552,554

*The following assumptions were made in the development of the data:

1) All costs are adjusted to reflect July 1, 1980 dollars.
2) All costs reflect requirements of the OSM permanent program regulations (unamended and without regard to the actions of the courts in remanding, enjoining or overturning them).
3) Costs estimated for alternative construction methods are based upon best engineering estimates.
4) General overhead costs are factored into the individual cost factor items.
5) Sites selected for analysis were typical sites without special problems which would tend to skew the cost figures.

SOURCE: Data provided through the National Coal Association and American Mining Congress, 1981.

spoil disposal would be to end-dump a porch large enough that spoil material would reach the bottom of the valley. The entire disturbed area in this phase of the operation is well within control capabilities of the downstream sedimentation-control structure. A portion of this material, which has been end-dumped, would then be transported to the face of the valley fill where a first lift would be constructed to serve as a retention structure for runoff to achieve sediment control for any further upstream disturbance and construction. The valley fill face would be carefully blended and controlled so as to prevent washout in the event of a major precipitation occurrence. Because of its rock nature, it would have high enough permeability to provide for seepage of water through the face, yet would control migration of sedimentation particles. Behind the face portion of the valley fill, the remaining fill would be constructed in a single-lift operation. The front portion of the valley fill would be raised and constructed with any necessary compaction or rehandling of the material in order to provide an adequate minimum factor of safety, while at the same time retaining sufficient porosity to prevent an unsatisfactory buildup of the phreatic surface. The face of the valley fill would be dressed and reclaimed in accordance with current practice.

Construction of the central portion of the valley fill would be done with present soils remaining in place. Merchantable timber would be removed, though the area would not be cleared or grubbed.

Major Problems Other Than Costs for Specific Operations

Current regulations require haulage of the excess overburden down to the elevation of placement in the valley fill. This results in hauling long distances over steep, downward grades. In addition to cost factors associated with this type of haul, operators are exposed to hazards inherent in the operation of any motor vehicle because of the long travel and are also subject to the particular hazard associated with haulage of heavy loads down steep grades.

In the fill analyzed in this study, it is estimated that approximately 85 million station yards of haul could be eliminated, reducing the hazards to the operators as well as the consumption of approximately 115,600 gallons of fuel.

COMPANY D

Cost Data

Cost data for Company D are presented in Table A-5. Increased costs resulting from requirements to conform to OSM regulations are largely associated with removal of vegetation, removal of topsoil and organic matter, road and drain construction, haulage of spoil, and spreading and compaction of spoil.

TABLE A-5 Company D Cost Data for Disposal of Excess Spoil*

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd^3 or acre	$ total	$ per yd^3 or acre	$ total
1. ENGINEERING COSTS				
a) Investigation		5,755		9,460
b) Testing		2,186		3,352
c) Design		1,160		17,418
d) Inspection and certification		5,199		5,199
e) Stability analyses		3,432		3,432
2. SITE PREPARATION				
a) Removal of vegetation	1,250/acre	108,750	1,250/acre	108,750
b) Removal of topsoil and organic matter	5,158/acre	448,746		
c) Construction of keeway cuts or rock toe buttresses	1/	1/	1/	1/
3. ROAD CONSTRUCTION		2,230,439		
4. CONSTRUCTION OF ROCK UNDER-DRAINS AND FILTERS OR CHIMNEY DRAINS		200,062		
5. CONSTRUCTION OF DIVERSION CHANNELS FOR SURFACE RUNOFF	2/	2/		
6. DRILLING AND BLASTING OPERATIONS				

TABLE A-5 Company D Cost Data for Disposal of Excess Spoil* (Continued)

COST FACTORS	Under Practices Required to Meet OSM Regulations		Under Alternative Engineering Practices	
	$ per yd3 or acre	$ total	$ per yd3 or acre	$ total
7. HAULAGE OF SPOIL	$0.203/yd^3$	2,131,500	$0.127/yd^3$	1,333,500
8. SPOIL SPREADING AND COMPACTION	$0.187/yd^3$	1,963,500	$0.019/yd^3$	199,500
9. CONSTRUCTION OF TERRACES FOR EROSION CONTROL AND STABILITY			3,744/acre	27,481
10. COVERING, GRADING, TOPSOILING AND SEED PREPARATION	3/	3/	3/	3/
11. REVEGETATION	4/	4/	4/	4/
12. OTHER (PLEASE SPECIFY)				
13. GRAND TOTAL		10,859,735		3,356,592

*The following assumptions were made in the development of the data:

1) All costs are adjusted to reflect July 1, 1980 dollars.
2) All costs reflect requirements of the OSM permanent program regulations (unamended and without regard to the actions of the courts in remanding, enjoining or overturning them).
3) Costs estimated for alternative construction methods are based upon best engineering estimates.
4) General overhead costs are factored into the individual cost factor items.
5) Sites selected for analysis were typical sites without special problems which would tend to skew the cost figures.

NOTE: 1/ Keyway cuts or rock toe buttress: Neither of these measures are needed at the selected fill; therefore, costs are not estimated.
2/ Construction of diversion channels for surface runoff: Design of diversion channels required under OSM method have not been prepared. Although there would be costs associated with this item, they have not been estimated for this project.
3/ Covering, grading, topsoiling, and seed-bed preparation: These costs have not been estimated but would be approximately the same regardless of the method selected.
4/ Revegetation: Costs have not been estimated. However, they would be approximately the same for both methods.

SOURCE: Data provided through the National Coal Association and American Mining Congress, 1981.

Technical Information

1. Mining method and disposal method pursuant to OSM requirements. The mining involves contour and mountaintop removal methods. A 10.5-million-yd^3 head-of-hollow fill is used for spoil disposal in the study area. In order to comply with "OSM Present Requirements," those operations listed in Table A-5 would generally be conducted as follows. (1) Engineering investigation, testing, analysis, and design are performed first, since this work is required before obtaining a permit. (2) Upon receipt of permits, removal of vegetation is conducted. Installation of at least part of the diversion ditches is performed concurrently with vegetation removal. (3) Road construction follows vegetation removal and precedes removal of topsoil and/or organic matter. (4) Although topsoil is nonexistent at this site, the road is used to haul organic material out of the fill area. This operation is intermittent. Organic material is stripped from the steep sides of the valley for a distance of about 25 ft above the valley floor before underdrain construction is begun. (5) Underdrain and filter construction follows along with additional work on diversion ditches to route most of the water away from the active filling operations. The previously constructed road provides access for transporting organic material out of the area and for bringing underdrain and filter material into the area. (6) Haulage of spoil is conducted over the same road after underdrain and filter have been placed for a sufficient distance. Prior to hauling, the spoil has been shot in such a way that about 95 percent will be less than 4-ft size. Spoil is dumped on the completed surface of the filter and spread with dozers in 4-ft layers. Compaction is also performed by crawler tractors. (7) After several layers of spoil have been placed, it is necessary to again strip the organic matter from the steep sides of the valley. This is done with dozers pushing the material onto the surface of the compacted spoil. The material is then loaded into trucks and hauled out of the area. This operation is repeated many times as the fill surface elevation rises. Also the underdrain and filter must be extended, and then more spoil can be placed in 4-ft layers. (8) As the fill reaches about 50 ft in height, layers of spoil are stepped back 20 ft to provide for terraces to control erosion of the final slope. Finally, grading and seed-bed preparation are performed, and then seeding is completed. These operations are described very briefly and generally, but the overall concept is as indicated.

2. Size of fill. The volume of the fill that is the subject of this study is 10,500 yd^3. Disposal of additional spoil is planned for the future but is not considered in this investigation. The surface area corresponding to the fill volume of 10,500,000 yd^3 is 87 acres with a maximum height to 260 ft.

3. Equipment and manpower. Listing of equipment types follows, and manpower sufficient to operate the machinery is, of course, provided. Not all the equipment listed is used at any one time. Instead the list includes all kinds of equipment needed for the entire project even though some of it is used only for a short time:

Rock trucks in sizes from 50-ton capacity to more than 100-ton capacity; Caterpillar D-9 dozers or equivalent; Caterpillar 992 loaders or equivalent; rotary drills; shovels with capacities from 10.5 to 20 yd^3; rock crusher.

4. Physical, chemical, and geotechnical properties of the spoil. The spoil is approximately 75 percent sandstone and 25 percent shale; pH averages about 8.0, and most of the material has SDI values of 90 or more. The spoil is mostly free draining and has little or no plasticity, low cohesion, and high friction angle.

5. Description of disposal site topography, slope angles, hydrologic conditions, rock types, and climatic conditions. The topography consists of a narrow (210-ft. ± wide) valley with steep side slopes of about 30° to 35° near stream level but flattening to about 27° at coal seam level. Valley profile is steep (50 percent) near the head and then flattens to about 10 percent at one third of the distance down from the head. Finally, the profile flattens to 3 percent or less under the downstream half of the fill. The area is characterized by a dendritic drainage pattern. Springs are not present, although hillside seepage occurs primarily in the form of "wet weather springs." Average annual stream discharge is about 1.3 csm. Underlying rock strata are interbedded sandstones, siltstones, and shales. Sandstone is the predominant rock. Annual precipitation is 45 in.

6. Description of construction method used in sound engineering alternative. The single-lift end-dump method is used. Site preparation consists of cutting, burning, or otherwise disposing of all standing and down timber. Trees are cut within about 6 in. of ground level, and the resulting stumps are left in place. Grubbing of stumps and roots is not performed for this fill. However, it must be pointed out that some fill foundations may require removal of stumps, roots, and weak surface materials. Testing of foundation material is necessary in all cases, and in this case the existing foundation materials exhibited strength and drainage properties similar to those of the spoil material. Since the foundation materials are thin and have good strength properties, there was nothing to be gained by removing them. Foundation treatment was governed by State Highway Department specifications for road-fill construction in the area. Stability analyses and actual experience both proved the procedure used to be correct. After site preparation, spoil is end-dumped. Care is taken to use only good rock on the advancing face of the end-dumped fill. The fill surface is crowned for good drainage. Spoil material is dumped from the face and the sides of the fill so that natural segregation provides the excellent underdrain and filtering system to permit free drainage. The method used results in a blanket drain along the original hillside as well as the valley bottom. Spoil is hauled at near zero grade and dumped, instead of traveling down to the valley bottom as with the 4-ft-layer method. This saves many thousands of gallons of fuel and avoids the huge cost of road construction needed in the 4-ft-layer method. However, it should be noted that in order to avoid the road construction costs, removal of stumps and roots must be deleted as well as 4-ft layers.

Finally, after completion of the fill, grading of the downstream face and construction of terraces are required. This is more costly than the 4-ft-layer method, where the terraces are provided by simply stepping back the succeeding layers of spoil. However, the cost difference is not great.

Major Problems Concerning Excess Spoil Regulations Apart from Costs

1. Safety. Requiring spoil to be hauled longer distances and over steeper grades increases the risk for equipment operators. Hauling spoil down into a valley for placement in 4-ft layers is much more likely to result in accidents than operation on a flat grade formed by the surface of an end-dumped fill.

2. Energy waste. The transportation of 10,500,000 yd^3 of spoil in compliance with OSM's 4-ft-layer requirement uses 340,000 gallons of additional fuel above that needed to do the same job by using the sound engineering alternative previously described.

3. Stability. Provided that sound engineering investigation and design are provided, the engineering alternative will often provide a greater margin of safety than the cookbook OSM method. Under the 4-ft-layer method, it is quite likely that perched water tables will be created. Such perched water tables will have some adverse effect on stability. The best approach is to provide sound engineering investigation and design and then construct the fill according to that design rather than some preconceived set of rigid rules laid down by someone who has never even seen the site. The 4-ft-layer method may be appropriate for some sites, but this needs to be determined by the responsible engineer rather than by regulation.

4. Productivity. The 4-ft-layer method uses more manpower to accomplish the same end product. Therefore overall productivity is reduced at a time when productivity needs to be increased.

5. Loss of flat land. Many studies have shown that one of the most important needs of mountainous areas is flat land. The 4-ft-layer rule and the requirement to remove stumps and roots in all cases have an effect on the number of fill sites that can be economically used for spoil disposal. The OSM present requirements preclude using many spoil disposal sites, and the result is that more spoil is returned to the pit area and even in mountaintop removal operations an approach toward the original contour is made. The loss of spoil disposal sites reduces the amount of flat land that will result from surface mining in the mountains.

6. Drainage problems. Increased sediment load is placed upon sediment ponds where surface runoff passes through an active fill area. It is often impractical to divert all surface drainage away from the active fill area when the fill area is being placed in the stream itself beginning at the downstream toe of the fill. This practice is required in the OSM method. Regardless of how carefully one plans the work, it is not usually practical to divert the entire surface runoff in steep mountain terrain. This requirement of beginning at the toe of the fill rather than the head of the hollow as in the engineering alternative eliminates many good fill sites from consideration or increases the drainage problems if they are used.

Appendix B

RESEARCH NEEDS RELATED TO EXCESS SPOIL, ENVIRONMENTAL CONDITIONS, AND ENGINEERING PRACTICES

In the course of its study, CODES noted a number of gaps and inadequacies in scientific and engineering knowledge that bear on disposal practices and regulatory requirements. Research could help resolve some of the issues surrounding the disposal of excess spoil. In a number of cases the research needed must be preceded by an extensive collection of data on the phenomena involved. A comprehensive analysis is needed to determine the research and data collection requirements for the effective and economical control of surface mining and reclamation, and that would undoubtedly yield a long list of needs. A partial listing of such research needs was identified by CODES during the course of the study.

Alternative Disposal Practices

The perimeter-dumping method of fill construction, in which the outslope is formed as a dam and the rest of the fill is dumped behind it, needs to be tested. Tests should include different patterns of fill dumping behind the dam.

Safety of Excess Spoil Embankments

OSM should determine the feasibility of developing performance standards for excess spoil embankment stability based on probability analysis and risk assessment.

Monitoring

Research on appropriate methods for monitoring fills after they are completed is needed.

Information Required for Stability Analysis

Large-scale testing should be undertaken to determine the effect of incorporating large rock fragments.

Water Pollution

Chemical pollution of surface runoff waters originating on excess spoil embankments needs to be monitored. The duration of this work should be long enough to cover conditions prior to construction, during construction, and for several years following construction.

Rainfall runoff relations of post-SMCRA excess spoil embankments with varying vegetative cover need to be examined.

Various aspects of drainage associated with excess spoil fills, especially changes in the hydrology of the surrounding area, should be investigated.

Leaching of excess spoil materials over time and new methods to treat spoil piles to minimize or prevent such leaching, based on the methods used in ore-dump leaching, should be investigated.

Air Pollution

Different modeling approaches are needed to compute emissions in large areas (such as states), individual spoil-pile emissions, emissions resulting from machinery use, and their combustion products.

Models to predict the concentrations of pollutants near the source are needed.

An empirical model of emissions produced by the cascading of end-dumping of spoil needs to be developed.

Alternative methods of spoil disposal need to be compared in a broad context that will take into account impacts on air quality resulting from excavating, loading, hauling, dumping, and spreading of spoil. Measurements should include particulate matter, carbon monoxide, nitrogen dioxide, and hydrocarbon levels in each of the disposal operations.

Comparisons should be made of the annual emissions inventory for each disposal method.

Land Impacts--Erosion and Sedimentation

Erosion rates for subsoils, graded or ungraded spoils, and replaced topsoils and subsoils should be examined.

The accuracy of the universal soil loss equation on lands being mined needs to be verified, and sediment delivery ratios need to be investigated.

Precipitation characteristics on mountainous upland areas, especially drop size distributions and energy relations and time-area-depth relations should be studied.

The quantitative effect of slope length should be further investigated.

The relationship of the soil parameters of structure, texture, organic matter content, moisture content, and soil profile permeability to erosion on excess spoil fills should be evaluated.

The relationships between spatial and temporal characteristics of precipitation and soil erosion, including frequency-intensity, frequency-duration, depth-area-duration, and yearly distribution pattern, need to be investigated.

The relative effect of slope steepness on erosion from raindrop splash as opposed to the effect of steepness on velocity and concentration of overload flow is another area of needed research.

Long-Term Productivity

The long-term productivity of excess spoil fills needs to be examined.

APPENDIX II

Additional Material Submitted by Mr. Hunter

TR-81W-002

ECONOMIC ASSESSMENT OF THE IMPACT ON COAL PRODUCTION DUE TO ENFORCEMENT OF THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

BENEFITS REPORT — VOLUME I, FINAL REPORT

October 6, 1980

Prepared for:

Department of the Interior
Office of Surface Mining Reclamation and
  Enforcement
Division of Planning and Evaluation
Washington, D.C. 20240

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CHAPTER I

I. INTRODUCTION

OVERVIEW

This report has been prepared as part of a study that The Orkand Corporation is conducting for the Office of Surface Mining Reclamation and Enforcement (OSM), U.S. Department of the Interior, under Contract Number J5191111. This study is entitled "Economic Assessment of the Impact on Coal Production Due to Enforcement of the Surface Mining Control and Reclamation Act of 1977." As suggested by its title, the study was intended to assess the major economic benefits and costs that are associated with the enforcement of the Surface Mining Control and Reclamation Act (SMCRA), which is administered by OSM. This report addresses the benefits of surface coal mining and land reclamation that follow from the Act.

As originally conceived, the study was to evaluate, preferably in monetary terms, the specific benefits and socio-economic impacts of SMCRA. However, it was apparent, in the course of the initial analysis, that historical evaluation of specific benefits and socio-economic/environmental impacts is complicated by the short time that SMCRA has been in operation. It was also apparent that development of substantive, and defensible, quantified estimates of benefits and impacts is hindered by the absence of a great deal of needed numerical data, and by incomplete understanding of the reclamation processes that the Act is intended to enhance.

STUDY LIMITATIONS

Rather than attempt to evaluate specific benefits and socio-economic/environmental impacts, OSM and The Orkand Corporation decided that the following are more appropriate goals for this study:

- Evaluate existing research studies on the impacts of surface mining, land reclamation, and SMCRA.
- Evaluate existing data sources relevant to surface mining, land reclamation, and SMCRA.

To accomplish these goals, the study team has: identified and reviewed research studies that address surface mining, land reclamation, and SMCRA; identified groups that have been active in this research; identified and reviewed a number of existing data bases of potential value to assessments related to SMCRA; discussed the Act, its impacts, and the estimation of these impacts with Federal and state agencies, and with other organizations who potentially have an interest in SMCRA-related matters; and visited selected surface coal mining regions to gain clearer insights into the socio-economic/environmental benefits and impacts of surface mining, land reclamation, and SMCRA. The subsequent chapters of this report describe these efforts, and present major findings and conclusions.

REPORT ORGANIZATION

This report is organized into the following four chapters, of which this is the first:

Chapter I - Introduction
Chapter II - Definition and Discussion of Benefits
Chapter III - Analysis of Benefits
Chapter IV - Findings and Conclusions.

Chapter II, Definition and Discussion of Benefits, discusses, in general, the notion of benefits, and provides a list of potential benefit categories, measures and recipients that are appropriate to considerations of SMCRA. Chapter III, Analysis of Benefits, discusses major characteristics of the reviewed research studies, and the various data sources that were examined during the study. Chapter IV, Findings and Conclusions, presents the major findings and conclusions of the study.

In the discussion of data sources, references to specific persons have been omitted. This omission is deliberate, and is based on the premise that communication with these parties was conducted for the purpose of gaining information and not for purposes of attribution. Given the controversy that surrounds SMCRA and its regulations, it is unclear how many of the parties would have been willing to cooperate if their identities were to be made known.

It should be noted that the positions ascribed to an agency or organization are those of its contacted spokesmen. While many of these positions undoubtedly reflect sentiments that exist within the contacted groups, they are not necessarily the official positions of the agency or organization, and should be interpreted accordingly. This qualification should not diminish the usefulness of the views expressed.

CHAPTER II

DEFINITION AND DISCUSSION OF BENEFITS

II. DEFINITION AND DISCUSSION OF BENEFITS

INTRODUCTION

SMCRA is based on the fundamental assumption that mining operations constitute an interim land use. Consistent with this assumption are several major provisions in the Act:

- Provisions for analyzing mining permit applications to identify premining land use and to determine whether the proposed mining operation is more socially valuable. If the premining land use is deemed of greater value, the site may be designated as unsuitable for mining.
- Provisions for minimizing adverse environmental impacts in coal mining regions during mining.
- Provisions for insuring that mined land is, after mining, capable of supporting productive applications. The regulations stipulate that reclaimed land be restored to premining, or higher, land use.

Benefits resulting from SMCRA depend on the Act's ability to meet the goals set by these provisions.

DEFINITION OF BENEFITS

According to Webster, benefits are things that in some sense promote well being. In terms of environmental improvement, a benefit may be regarded as the value that is assigned to such an improvement by individuals who are affected by it. More formally, in terms of rigorous benefit/cost analysis, Freeman defines the benefit of an environmental improvement as:

> "the sum of the monetary values assigned to these (beneficial) effects by all individuals directly or indirectly affected by that action. These monetary values are often referred to as 'willingness to pay'".[1]

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[1] A. Myrick Freeman. The Benefits of Environmental Improvement, Theory And Practice (Baltimore and London: The Johns Hopkins University Press, 1979), p. 3.

As used by OSM in its Final Environmental Statement for SMCRA's permanent regulations, an environmental impact of a regulation is defined as:

> "a change — beneficial or adverse — in the resource as it exists before mining."[2]

Based on this definition, a regulatory benefit associated with SMCRA may be defined as a beneficial change that occurs in mine-affected resources. This definition is used in the current report because:

- it is consistent with generally accepted definitions of benefit such as those presented above.
- it permits consideration and inclusion of research into potentially beneficial regulatory impacts that have not yet been given a monetary expression.
- it permits consideration and inclusion of research into socio-economic and environmental impacts of surface coal mining; alleviation of many of these impacts would, if attributable to SMCRA, be benefits of the Act (such impacts are considered for this reason).

TYPES OF BENEFITS

Benefits may be classified into one of three categories:

- Monetary benefits: For benefits in this category, beneficial changes which occur in affected resources have accepted, established marketplaces that assign them monetary value.
- Quantitative benefits: For these benefits, numerical measures of the beneficial changes that occur in affected resources exist. The units of numerical measure may either be monetary or nonmonetary.
- Qualitative benefits: For benefits in this category, beneficial resource changes are known to occur, but numerical measurement of these changes is either tenuous or impossible.

A benefit's category reflects its ability to be numerically measured and rigorously analyzed.

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[2] Office of Surface Mining Reclamation and Enforcement, U.S. Department of the Interior. Permanent Regulatory Program Implementing Section 501(b) of the Surface Mining Control and Reclamation Act of 1977, Final Environmental Statement (Washington, D.C.: Office of Surface Mining Reclamation and Enforcement, U.S. Department of the Interior, January 1979), p. A. III-1.

BENEFIT CATEGORIES, MEASURES AND RECIPIENTS

Exhibit 2.1 provides a taxonomy of potential benefits specific to SMCRA, identifies anticipated recipients of these benefits, and suggests appropriate units of measure that may be associated with each benefit. These benefits are defined to reflect differences between pre-SMCRA and post-SMCRA operating environments, and to therefore reflect the incremental impact of the Act. Implicit in this Exhibit are assumptions relating to study goals and estimation methodologies that are not always common to relevant research in this field.

As suggested by the Exhibit, benefits of SMCRA can be classified into various categories. The following three categories can, however, serve as a foundation for any classification system:

- Land — maintenance of, or improvement in, the land's premining productivity level; increased land utilization; other land-related benefits.
- Water — maintenance of, or improvement in, water quality or supply; reduction in damage caused by water pollution attributable to mining operations; other hydrologic considerations.
- Other — elimination of other environmental damage attributable to surface mining; other benefits not elsewhere classified.

It is obvious that certain benefits can be assigned to multiple categories. For example, an increase in land value can result from an improvement in land productivity and/or an improvement in water quality. To avoid the problem of "double counting", benefits are often classified on the basis of strongest, discernable, proximate relationship.

APPLICATION OF BENEFIT CATEGORIES, MEASURES AND RECIPIENTS TO PRESENTATION OF RESULTS OF REVIEWED RESEARCH STUDIES AND DATA SOURCES

In evaluating benefits that accrue to SMCRA, one would ideally like to use benefit categories, measures and recipients such as those presented in Exhibit 2.1. Given, however, the constraints on available information — both in terms of the research studies and data sources that this study reviewed — this is not always feasible. The following complications will confront any attempt at utilizing the Exhibit's contents:

- To suit site-specific requirements (often unstated), benefit categories are frequently defined quite differently by different researchers.

EXHIBIT 2.1

POTENTIAL STUDY BENEFITS

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
1. Land				
a. Restoration of/ improvement in mined land's productivity	a. Increase in value of products grown on land, e.g., $/acre planted	a. Increase in units produced/unit of land, e.g., bushels/acre		a. Property owners, society
b. Restoration of/ improvement in the utility of mined land for commercial/industrial applications	b. Increase in value of land, e.g., $/acre	b. Increase in number of building permits issued for commercial/industrial purposes; increase in employment in industrial/commercial sector	b. Qualitative description of changes in affected mined land area that cause a maintained or improved potential for industrial/ commercial purposes	b. Property owners, private companies (non-coal mining)
c. Restoration of/ improvement in the utility of surrounding land for commercial/ industrial applications	c. Increase in value of land, e.g., $/acre	c. Increase in number of building permits issued for commercial/industrial purposes; increase in employment in industrial/commercial sector	c. Qualitative description of changes in affected surrounding area that cause a maintained or improved potential for industrial/ commercial purposes	c. Property owners, private companies (non-coal mining)
d. Restoration of/ improvement in the utility of mined lands for residential applications	d. Increase in value of land, e.g., $/acre	d. Increase in number of housing permits issued; increase in number of housing starts; increase in number of home loans issued	d. Qualitative description of changes in affected mined land area that cause a maintained or improved potential for residential purposes	d. Society, property owners, private companies (non-coal mining)
e. Restoration of/ improvement in the utility of surrounding land for residential applications	e. Increase in value of land, e.g., $/acre	e. Increase in number of housing permits issued; increase in number of housing starts; increase in number of home loans issued	e. Qualitative description of changes in affected surrounding area that cause a maintained or improved potential for residential purposes	e. Society, property owners, private companies (non-coal mining)

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
I. Land (continued)				
f. Restoration of/ improvement in the utility of mined lands for agricultural/ forestry applications	f. Increase in value of land, e.g., $/acre	f. Increase in number of acres planted	f. Qualitative description of changes in affected mined land area that cause a maintained or improved potential for agricultural/ forestry purposes	f. Private companies (non-coal mining), property owners
g. Restoration of/ improvement in the utility of surrounding land for agricultural/forestry applications	g. Increase in value of land, e.g., $/acre	g. Increase in number of acres planted	g. Qualitative description of changes in affected surrounding area that cause a maintained or improved potential for agricultural/ forestry purposes	g. Private companies (non-coal mining), property owners
h. Restoration of/ improvement in the utility of mined land for recreational applications	h. Increase in value of land, e.g., $/acre	h. Increase in number of visitors to recreational facilities on mined land	h. Qualitative description of changes in affected mined land area that cause a maintained or improved potential for recreational purposes	h. Society, property owners, private companies (non-coal mining)
i. Restoration of/ improvement in the utility of surrounding land for recreational applications	i. Increase in value of land, e.g., $/acre	i. Increase in number of visitors to recreational facilities on surrounding land	i. Qualitative description of changes in affected surrounding area that cause a maintained or improved potential for recreational purposes	i. Society, property owners, private companies (non-coal mining)

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
I. Land (continued)				
j. Reduction in property damage caused by reduction in landslides attributable to the mining operation	j. Reduction in costs to property from land slide damage due to the mining operation	j. Reduction in number of damaged structures due to landslides attributable to the mining operation	j. Qualitative description of improved conditions in affected area that would result from control of landslides	j. Property owners
k. Reduction of highwall (aesthetic and		k. Reduction in accidents due to the highwall	k. Improvements in the aesthetic qualities of the affected land and reductions in accidents	k. Society
l. Reduction in fatal/nonfatal injuries caused by reduction in landslides attributable to the mining operation		l. Reduction in number of injuries/loss of lives due to landslides attributable to the mining operation	l. Qualitative description of improved conditions in affected area that would result from control of landslides	l. Society
m. Reclamation cost offsets generated by the sale of commodities produced as a result of reclamation activities (e.g., sale of cash crops grown as part of reclamation program)	m. Net sales of commodities produced			m. Coal mining companies
n. Reduction in reclamation costs due to integrated reclamation mining operation	n. Cost savings	n. Reduction in labor, material, and equipment requirements		n. Coal mining companies

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
2. Water				
a. Maintenance of/ improvement in the quality of water that originates in/ passes through the mined area		a. Reduction in level of water-borne pollutants discharged from the mine site into the receiving surface and/or ground water	a. Qualitative description of improved hydrologic conditions; e.g., a body of water exudes a more pleasant odor	a. Society
b. Maintenance of/ improvement in the utility of mine-affected water for commercial/industrial applications	b. Reduction in water treatment costs downstream from the mining operation	b. Increase in number of building permits for industrial/commercial concerns that use large quantities of water	b. Qualitative description of improved hydrologic conditions and increased use of water for commercial/industrial use	b. Private companies (non-coal mining)
c. Maintenance of/ improvement in the utility of mine-affected water for residential/ human consumption applications	c. Reduction in water treatment costs downstream from the mining operation	c. Increase in number of gallons of water consumed for residential/human purposes	c. Qualitative description of increased use of mine-affected water for personal purposes and reduction in illness/loss of life due to consumption of mine-affected water	c. Society
d. Maintenance of/ improvement in the utility of mine-affected water for recreational applications	d. Reduction in water treatment costs downstream from the mining operation	d. Increase in number of visitors to recreational areas with aquatic facilities	d. Qualitative description of changes in affected water that cause a maintained or improved potential use for recreational purposes	d. Society, property owners

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
2. Water (continued)				
e. Maintenance of/ improvement in the quality of mine-affected water for aquatic habitats	e. Maintenance of, or increase in, revenues of industries working aquatic habitats (e.g., fishing industries)	e. Maintenance of, or improvement in, physical counts that reflect the the conditions of aquatic communities affected by the mining operation	e. Qualitative assessment of improvement in aquatic habitats	e. Society, private Companies (non-coal mining)
f. Maintenance of/ improvement in the utility of mine-affected water for irrigation	f. Reduction in water treatment costs downstream from the mining operation	f. Maintenance of, or increase in, the units produced per acre due to the quality of irrigation water; increase in the number of acres irrigated	f. Qualitative description of improved hydrologic conditions and increased use of water for irrigation purposes	f. Property owners, private companies (non-coal mining)
g. Reduction in property damage caused by mitigation of flooding	g. Reduction in costs from flood damage due to siltation attributable to the mining operation	g. Reduction in the number of units of property damaged due to the mitigation of flooding	g. Qualitative description of improved condition of property due to the mitigation of flooding	g. Property owners, society
h. Reduction in fatal/non-fatal injuries caused by mitigation of flooding		h. Reduction in number of fatal/non-fatal injuries caused by mitigation of flooding	h. Qualitative description of reduction in injury/loss of life due to the mitigation of flooding	h. Society
i. Reduction in property damage through water pollution that is mitigated by SMCRA regulation	i. Reduction in maintenance and replacement costs for structures and equipment damaged by acid and chemical pollution attributable to the mining operation	i. Reduction in the number of units of property damaged by water pollution attributable to the mining operation	i. Qualitative description of improved condition of property protected from water pollution effects	i. Property owners, society

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
2. Water (continued)				
j. Enhanced property values for land bordering bodies of water affected by discharges from mining operations	j. Increase in value of land bordering streams and rivers affected by discharge from the mining operation	j. Reduction in the number of units of property damaged by water pollution attributable to the mining operation	j. Qualitative description of improved condition of property protected by SMCRA regulation	j. Property owners

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
3. Other				
a. Reduction in injuries or property damage that would otherwise occur because of mining operations on natural hazard lands, i.e., lands subject to frequent flooding and/or of unstable geology	a. Savings in cost associated with repair or replacement of damaged property	a. Reduction in number of injuries/loss of life	a. Qualitative description of reduction in injury/loss of life and property damage	a. Society
b. Reduction in injuries or property damage caused by SMCRA's regulations on the use of explosives on the mine site	b. Savings in cost associated with repair or replacement of damaged property	b. Reduction in number of injuries/loss of life or amount of property damage	b. Qualitative description of reduction in injury/loss of life and property damage	b. Society, coal mining companies, property owners
c. Reduction in significant damage to fragile or historic lands possessing important historic, cultural, scientific and/or aesthetic values	c. Savings in cost associated with return of damaged historic or fragile lands to their former specifications and qualities	c. Increase in number of visitors to the designated lands	c. Qualitative description of the value the designated lands contribute to society	c. Society

EXHIBIT 2.1 (cont.)

BENEFIT CATEGORY/ BENEFIT	QUANTITATIVE MEASURE (MONETARY)	QUANTITATIVE MEASURE (NONMONETARY)	QUALITATIVE DESCRIPTION	PRIMARY RECIPIENT(S) OF BENEFITS
3. Other (continued)				
d. Enhanced regional transportation made possible by the construction of quality mine roads that can be made available for public use after mining operations cease	d. Savings in cost associated with construction of public roads		d. Qualitative description of improved road transportation system	d. Society
e. Restoration or enhancement of the habitats of important fish and wildlife species		e. Increase in number of fishing and hunting licenses issued; increase in wildlife counts	e. Qualitative description of improved habitat for fish and wildlife	e. Society
f. Reduction in fugitive dust occasioned by SMCRA air pollution regulations	f. Savings in costs associated with medical treatment mdnt of fugitive dust victims	f. Reduction in absenteeism of working persons victimized by fugitive dust ailments	f. Qualitative description of improved health and visibility due to fugitive dust control	f. Society
g. Enhanced aesthetic quality of environment occasioned by SMCRA		g. Increased number of visitors to areas that are pleasant to the human senses	g. Qualitative description of the improvement in the aesthetic qualities and characteristics of the salient environment	g. Society

- Each generic benefit category (such as water quality) contains numerous subcategories (e.g., lowered acidity, lower turbidity, lower concentrations of soluble heavy metals, lower concentrations of salts, etc.). Detailed presentation of research results by specific subcategories can be cumbersome and, in the context of the relatively small number of studies reviewed for this report, are not too meaningful.

- The methodologies and units of measure used by researchers to estimate benefits are site-specific and vary greatly. Monetary benefits, for example, are measured in dollars of different years and, in many cases, these years are not identified. The resulting inability to adjust dollar values to those of a common year make comparison of monetary results of little value.

- In a number of studies, benefits are treated as interrelated systems that jointly further social welfare. To attempt to separate these benefits and present their individual results can, on the basis of available study information, be quite tenuous.

Because of these complications, modified schedules of benefit categories that reflect currently available data and research will be used to present the study's findings. These schedules will accomodate, in a more manageable fashion, the results of our investigations into relevant research studies and data sources.

CHAPTER III

ANALYSIS OF BENEFITS

III. ANALYSIS OF BENEFITS

Information concerning socio-economic and environmental benefits and impacts which are potentially relevant to assessments of SMCRA come from existing research studies, contacts with interested government agencies and research organizations, and reviews of published data bases and other data sources. The remainder of this chapter will be presented in three sections:

- Characteristics of reviewed research studies.
- Characteristics of information provided by government agencies and research organizations.
- Characteristics of reviewed data sources.

Material in each section is, to the extent possible, presented by appropriate benefit/impact category (identified by section sub-headings).

Discussion of the reviewed studies in this chapter is limited to their characteristics; findings from these studies are presented in Chapter IV. Discussions of contacts with government agencies and research organizations, and reviews of data sources, include both characteristics of these activities and a summary of their outcomes.

CHARACTERISTICS OF REVIEWED RESEARCH STUDIES

Introduction

The purpose of this section is to evaluate the status of research into: the social, economic, and environmental impacts that are associated with surface coal mining and land reclamation; the benefits that accrue from SMCRA and its regulations. To accomplish these ends, studies were reviewed to:

- Identify benefits and impacts that have been addressed by the research community
- Determine the state of knowledge that is associated with each benefit and impact
- For quantifiable benefits and impacts:
    - determine the units of measure employed
    - review and evaluate the estimating methodologies employed
    - review numerical estimates of benefits and impacts, when available

- For non-quantifiable benefits and impacts, summarize the state of knowledge that is associated with each benefit and impact.

Initially, emphasis was placed on identifying (and reviewing) benefits and impacts that are related directly to SMCRA. As the review progressed and contacts were made with the research community that is involved in surface coal mining, it became clear that too little time has elapsed since the Act's passage to permit many assessments to have been made. Because of this, emphasis was shifted to benefits and impacts that are associated with the more general topics of surface mining and reclamation.

Criteria For Study Selection

Published research concerning the potential benefits and impacts of surface mining and reclamation appear to be extensive but not very cohesive. This lack of cohesion appears due, in part, to factors such as:

- Many groups have worked in the field but are not, in numerous instances, aware of each other's activities.
- Certain benefits and impacts have been subjected to extensive, often repetitive, research; other benefits and impacts have been virtually ignored.

Because the literature is fragmented, efforts were made to identify a representative, and reasonably comprehensive sample of studies. The selected sample, while not exhaustive, is believed to contain many significant studies that have been completed to date. Ongoing research, for which published reports are unavailable, are not represented in this sample.

In selecting studies for review, three criteria were employed:

- At least one study addressing reclamation benefits and impacts would be chosen for each coal producing region in the country.
- As wide a range of benefits and impacts as possible, would be contained in the selected sample.
- Only studies completed after 1970 would be reviewed. It was felt that this restriction would disqualify very few significant studies, and would facilitate the identification of relevant studies in the shortest amount of time.

Actual studies were identified on the basis of:

- Communications with federal and state agencies who are involved with surface coal mining and related land reclamation
- Communications with organizations doing research into surface coal mining and land reclamation

- Publication lists produced by agencies doing research in surface coal mining and land reclamation

- Bibliographies of published materials that are relevant to surface coal mining, land reclamation, and/or environmental protection.

The bibliographies and publication lists used for this purpose appear as a separate section in this report's Bibliography.

Characteristics of Reviewed Studies

A sample of 68 studies were selected for review. These studies were classified, according to their geographical study area, into the following regions:

- National

- Appalachia

- Midwest

- West

- South Central

Exhibit 3.1 identifies the states that are included in each region. The distribution of studies, by region, is shown in Exhibit 3.2.

A summary of each reviewed study is provided in Appendix 1. Each summary consists potentially of three parts:

- Complete bibliographic citation. This includes the author, title and date of the report, the source, the stock order number (whenever available), and the geographic study area addressed.

- Tabular summary of benefits and socio-economic or environmental impacts that are addressed in the study. Wherever possible, this section identifies the analytical methods that were used in assessing each benefit or impact, and the units of measure that were employed when quantification was possible. Results of the assessment, whether qualitative or quantitative, are given.

- A Comments section. This section contains findings of the report that cannot readily be presented in tabular form. Also included, when appropriate, is the reviewer's evaluation of the relevance of the report to economic assessments related to SMCRA.

The bibliographic and comments sections are presented for every reviewed study. The tabular summary of benefits and impacts is provided whenever a report's findings are amenable to this form of presentation.

EXHIBIT 3.1

DEFINITION OF STUDY REGIONS BY STATE

National:	All coal-producing states in the United States	
Appalachia:	Alabama Georgia Eastern Kentucky Maryland Ohio	Pennsylvania Tennessee Virginia West Virginia
Midwest:	Illinois Indiana Western Kentucky	
West:	Arizona Colorado Montana New Mexico	North Dakota Utah Washington Wyoming
South Central :	Arkansas Iowa Kansas	Missouri Oklahoma Texas

EXHIBIT 3.2

REGIONAL DISTRIBUTION OF REVIEWED STUDIES

Study Region	Number of Reviewed Studies	Number of Studies with Tabulated Results
National	13	2
Appalachia	31	19
Midwest	5	4
West	17	9
South Central	2	1
	68	35

Because they are quite extensive, the summaries of the reviewed studies appear in an appendix and not in the main text. This form of presentation is intended to maintain continuity in the text and should in no way detract from the importance of the summaries; readers unfamiliar with research in the field would profit greatly from even a cursory examination of this material.

Examination of Exhibits 3.2 and 3.3 reveal that, in the sample of studies reviewed:

- The regions experiencing the greatest research activity are Appalachia and the West.
- Tabulated (i.e. specifically identified) benefits/impacts are presented for all regions, with Appalachia possessing the greatest number of studies that address specific benefits/impacts.
- The number of studies that present numerical estimates of specific benefits/impacts is less than the number of studies that identify such benefits/impacts (23 vs 35)
- Only 31% of the reviewed studies with tabulated benefits/impacts present monetary estimates for at least some of their benefits/impacts; studies in Appalachia most frequently present such monetary estimates (8 of the 11 studies with monetary estimates are associated with Appalachia).

A review of the study summaries in Appendix 1 reveals that the benefit categories, and/or specific benefits addressed, tend to vary by study region. The schedule of benefits/impacts contained in Exhibit 3.4 reflects an attempt to present a comprehensive benefits summary in a manageable form. An examination of this exhibit reveals that, for the studies sampled:

- The most frequently addressed benefit/impact areas, in Appalachia, are:
  - mine-related personal injury and property damage;
  - benefits/impacts associated with water quality;
  - benefits/impacts associated with fish, wildlife, and their habitats.

Monetary estimates for the benefits/impacts associated with: injury; property damage; and fish, wildlife and their habitats; are provided.

- The most frequently addressed benefit/impact areas in the West are associated with:
  - land characteristics (e.g. chemical);
  - hydrology;
  - fish, wildlife, and their habitats

EXHIBIT 3.3

NUMBERS OF STUDIES, BY REGION, THAT IDENTIFY AND QUANTIFY BENEFITS AND IMPACTS OF SURFACE COAL MINING AND RECLAMATION

Region	Number of Reports	Number of Reports With Tabulated Benefits and Impacts	Number of Reports With Quantified Benefits and Impacts	Number of Reports With Monetary Benefits and Impacts
National	13	2	1	1
Appalachia	31	19	16	8
Midwest	5	4	3	1
West	17	9	2	1
South Central	2	1	1	0
Total	68	35	23	11

EXHIBIT 3.4

NUMBER OF STUDIES, BY REGION, THAT ADDRESS SELECTED BENEFIT/IMPACT CATEGORIES

AREA OF BENEFIT/IMPACT	APPALACHIA	MIDWEST	SOUTH CENTRAL	WEST	NATIONAL	ROW TOTALS
Abandoned Mine Land	1*					1
Aesthetics	3*			1*		4
Air Quality, Fugitive Dust		1		1	1	3
Competition, Economic	1					1
Fish, Wildlife & Their Habitats	5*			2		7
Floods	3	1				4
Hydrology	2			2		4
Land Area Disturbed				1		1
Land Characteristics	2		1	3		6
Land Uses/Value	3*	1		1		5
Local/State Government, Impacts On				1		1
Mine Operations/Productivity	1					1
Personal Injury/Property Damage	8*	1*				9
Recreation				1*	1*	2
Revegetation				1		1
Socio-Economic Impacts	2					2
Water Quality	8		1	1		10
Water Supply		1		1		2

* Benefit/Impact area for which monetary estimates have been provided.

No monetary estimates are provided in any of these areas.

- Relatively few benefit/impact areas are addressed in the Midwest, South Central, or National study regions. Within study region, the distribution among benefit/impact areas is uniform (i.e. all areas occur with equal frequency).

- The scarcity of studies reviewed for the Midwest, South Central and National study regions make further inferences concerning their benefit/impact characteristics tenuous.

The contents of Exhibit 3.5 are designed to identify the geographical level at which tabulated benefits/impacts are studied. An examination of this exhibit reveals that, for the reviewed studies:

- The majority of the studies with tabulated benefits/impacts (i.e. 71%) involved local study areas (e.g. watersheds; mine-sites and contiguous areas; counties containing mining activity).

- Only in the National and Midwest, and to a lesser extent the West regions are an appreciable fraction of the studies conducted at the state, regional or national levels (i.e. 100%, 50% and 33% respectively).

CHARACTERISTICS OF INFORMATION PROVIDED BY GOVERNMENT AGENCIES AND RESEARCH ORGANIZATIONS

Government agencies and research organizations with presumed interests in surface mining, land reclamation, or other SMCRA-related topics were contacted to:

- Acquire information possessed by such organizations that would be useful in making benefit/impact assessments, but that do not exist in the published literature or existing data bases.

- Identify significant research reports that could not be identified from other references sources.

- Identify sources of numerical data that could be used in conducting benefit/impact assessments of surface mining, land reclamation, or other SMCRA-related activities.

Summaries of communications with contacted agencies appear in Appendix 2. The discussion which follows employs the following benefit/impact categories:

- Impacts and benefits related to agricultural activities.

- Land-related impacts and benefits, other than agricultural.

- Impacts and benefits related to water quality.

- Impacts and benefits associated with water-related property damage.

EXHIBIT 3.5

GEOGRAPHIC AREAS ASSOCIATED WITH BENEFITS/IMPACTS ANALYSES

STUDY REGION	NUMBER, TABULATED STUDIES	GEOGRAPHIC SCOPE OF STUDY AREA					
		WATERSHED	MINE SITE	COUNTY	STATE/ REGION	NATIONAL	OTHER
Appalachia	19	12	3	2	2		
Midwest	4		2		2		
South Central	1		1				
West	9		4	1	3		1
National	2					2	
TOTAL	35	12	10	3	7	2	1

- Impacts and benefits related to fish, wildlife, and their habitats.
- Mine-related injuries and illnesses.
- Impacts of government regulations on the coal industry.
- Impacts and benefits related to air quality.
- Socio-economic impacts and benefits.
- Multiple impact/benefit concerns.

Impacts/Benefits Associated With Agricultural Activities

Contacts were made with:

- The Economics Research Service, U.S. Department of Agriculture;
- the Statisticians-in-Charge in the state Departments of Agriculture in Illinois and Tennessee;

concerning price and production data for various agricultural commodities. Descriptions of the data bases suggested by these agencies appear in the section of this report addressing data sources.

Both the Illinois Department of Agriculture, and the School of Agriculture, University of Illinois, are involved in research relevant to evaluating mined land reclamation. The former group is developing an information depository on mined land reclamation; the latter group is involved with field studies concerning land reclamation.

Other Land-Related Impacts/Benefits

While its research is not surface mining- or SMCRA-specific, the Office of Research and Development, U.S. Environmental Protection Agency, does conduct research into environmental impacts that are associated with land disturbances. With regard to landslides, which sometimes follow from mine-related land disturbances, the U.S. Geological Survey produces maps that identify to landslide prone areas.

With respect to negative impacts that follow from the disturbance of various types of fragile land, the Division of Preservation Policy, U.S. Department of the Interior, is developing a methodology for assigning a quantified measure of value to the preservation of historic places.

Impacts/Benefits Related To Water Quality

The University of Tennessee has been very active in evaluating the socio-economic and environmental impacts of surface coal mining in Tennessee. Impacts that such operations exert on water quality have been examined in depth; summaries of much of this research appear in Appendix 1.

The U.S. Environmental Protection Agency conducts research into water quality, though such efforts are not coal mining-or SMCRA-specific. EPA also maintains the National Pollutant Discharge Elimination System, which reports, among other things, on point discharges of mine effluents, from operating mines, into surface waters. This information system is manual, (i.e. not computerized), and its records are kept at EPA's regional offices.

Impacts/Benefits Associated With Water-Related Property Damage

Along with its research into water quality, the University of Tennessee has conducted extensive research into mine-related property damage. Most of the observed damage was found to be flood or sediment related. With regard to floods, the U.S. Geological Survey produces maps that identify flood prone areas.

Impacts/Benefits Related To Fish, Wildlife, Habitats

The Eastern Energy Land Use Group, U.S. Department of the Interior, indicated that fish and wildlife data bases are currently being prepared for Alabama and West Virginia. Contacts with the Game and Fish Division, Alabama Department of Conservation, revealed that the state is involved with three fish and wildlife assessment studies, one of which involves the Division. Information on the two remaining studies is available from the Alabama Office of State Planning and Federal Programs, and from the School of Agricultural Economics, Auburn University.

Mine-Related Injuries And Illnesses

The Mine Safety and Health Administration, U.S. Department of Labor, maintains a computerized data base on mine-related injuries that are subject to provisions of the Mine Safety and Health Act. Data from this source are often 1 to 2 years old and may, because of the types of accidents reported, be primarily suited to assessments of impacts and benefits of MSHA and not SMCRA.

Regulatory Impacts On The Coal Industry

The Virginia Division of Mined Land Reclamation indicated that difficulties experienced by the state's coal industry appear to have been caused by both conditions in the coal market, and by the requirements that are imposed on coal producers by SMCRA. As a result of these requirements, it was felt that a trend might be developing toward underground coal production.

Impacts/Benefits Relating To Air Quality

Assessments of the environmental impacts of air pollution have been conducted by the U.S. Environmental Protection Agency. These assessments have not been specific to surface mining activities.

Socio-Economic Impacts/Benefits

Assessments of socio-economic impacts that are associated with coal mine development have been conducted by the Office of Coal Management, U.S. Department of the Interior. These assessments have been made for mines located in Alabama and the West.

Multiple Benefit/Impact Concerns

Both the Argonne National Laboratory and the Division of Environment, Bureau of Mines, U.S. Department of the Interior, have conducted a wide range of assessment studies involving mining and/or reclamation activities.

CHARACTERISTICS OF REVIEWED DATA SOURCES

A search was conducted for data bases and other existing information sources that would be valuable in assessing benefits and impacts of the sort described in Exhibit II-1. While all potentially relevant data were sought and, when identified, reviewed, special attention was devoted to those data which are:

- presented at the local level (e.g., by counties, watersheds, etc).
- which report on pre- and post-SMCRA operating environments; for this purpose, data through 1979, and preferably into 1980, are desired.

Such data permit adequate consideration to be given to the site-specific nature of many SMCRA-related impacts; favorable changes in these impacts, occurring after the inception of SMCRA, are potential benefits of the Act.

Detailed summaries of reviewed data bases and other published information sources appear in Appendix 3. In the discussion which follows, these sources are presented in the following benefit/impact categories:

- Impacts and benefits related to mine-affected land
- Impacts and benefits related to mine-affected residential activities.
- Personal injury and illness related to surface mining activities.
- Property damage related to surface mining activities.
- Impacts and benefits associated with fish and wildlife, and their habitats.

Data sources were not located for the other benefit categories appearing in Exhibit II-1.

Land-Related Benefits/Impacts

Data on agricultural production are available, by county, for selected types of crops and livestock. The most recent of these data are between 1 and 2 years old, and are available through the Statistician-in-Charge in the various states. Another source of similar data is the 1978 Census of Agriculture.

Detailed information on land characteristics and usage are available, for many counties, from the Soil Survey reports prepared by the U.S. Soil Conservation Service. Maps showing land usage are available from the U.S. Geological Survey.

At the state level, data on agricultural prices are available either from the states or the U.S. Department of Agriculture; such data are current. Data on numbers of farms, farm size (acres), and farm land values are also available by state.

Benefits/Impacts Related To Residential Activities

Since residential impacts of mined land reclamation can occur only in the immediate vicinity of a mine, evaluation of such impacts must begin at the local level. At this level, the only located information source addressing housing activity is the U.S. Bureau of the Census. The data in question report on the number of building permits that are granted by permit-issuing jurisdictions each year.

To assist in the evaluation of land sites for residential applicatons, the Federal Housing Administration issues general guidelines that are employed in making such evaluations. These guidelines specifically address a number of conditions that would be found at reclaimed mine sites.

Mine-Related Injuries And Illnesses

The American Red Cross provides data on the numbers of persons killed, injured, and hospitalized as a result of disasters with which the organization becomes involved. Data elements that identify the time, place, and nature of the disaster provide a basis for drawing inferences concerning its relationship to neighboring mining activities; data for establishing definitive relationships between reported disasters and mine operations do not, however, exist.

Data on mine-related traffic accidents that occur on public roads are available from the National Highway Traffic Safety Administration. Such data, pertaining to numbers of fatalities, can be inferentially related to mining activity through data elements that report on accident location; insufficient data exist for establishing definitive relationships between such accidents and mine operations.

Mine-Related Property Damage

As part of its disaster data base, the American Red Cross maintains data on disaster related damage that occurs to residential properties and to small businesses. Inferences can be drawn concerning relationships that may exist between such damage and mining activity; establishment of a definitive relationship is not, however, possible.

Mine-Related Impacts On Fish, Wildlife And Habitats

Data for evaluating the impacts of surface mining and land reclamation on fish, wildlife, and their habitats appear to be relatively scarce; data bases which were located pertain to fish. These data, which primarily address commercial fishing activity, were provided by the National Marine Fisheries Service, U.S. Department of Commerce. On the state level, data are available on the volume and value of fish landings, and on the employment of resources that are involved in this effort. No local (i.e. county or lower) level data are available from this source.

Data on the monetary value of selected fish species are available from the Tennessee Wildlife Resources Agency. These data, expressed in 1974 dollars, are specific to the southeast United States, and reflect the values of the fish at the hatchery.

CHAPTER IV

FINDINGS AND CONCLUSIONS

IV. FINDINGS AND CONCLUSIONS

Much of this chapter is devoted to a discussion of significant findings that emerged from the current study's review of existing SMCRA-related research. In evaluating and utilizing these findings, it should be remembered that:

- The findings are from a sample of the total population of relevant published studies. Since the randomness of the sample is not statistically established, inferences drawn from it for the entire population must be employed with caution.
- Since the specific findings discussed below are derived for site-specific conditions, their presentation in this chapter should be regarded as suggestive of trends and not as definitive benefit/impact estimates.

Based on the findings discussed in this report, and on the report's examination of various data and information sources, it is clear that deficiencies exist in the body of information that will be required to assess SMCRA's benefits and impacts at the state, regional, or national level. Chapter IV concludes with a presentation of these deficiencies.

FINDINGS

Certain findings from the current review of existing research are independent of the benefit/impact categories under consideration (i.e. general findings); other findings are associated with specific benefit/impact areas (i.e. specific findings). In the discussion which follows, general findings will be presented first.

General Findings From Reviewed Research

- Virtually all of the reviewed research relates to socio-economic or environmental impacts of surface mining and land reclamation. Other SMCRA-related matters, such as premine planning, are seldom addressed.
- Research into surface mining and subsequent land reclamation appears to have been most extensively conducted in Appalachia. Of the 68 studies reviewed, 31 (i.e. 46% of the total) address benefits or impacts in this region.
- In all study regions except National, at least 50% of the reviewed studies contain numerical estimates (monetary or otherwise) of at least some of their benefits or impacts. In the National region, only 2 of 13 studies provide such estimates.

- The number of studies that provide monetary estimates of benefits or impacts constitute a small fraction of the total number that were reviewed. By region, 8 of 31 Appalachian studies, 1 of 17 Western studies, 1 of 13 National studies, 1 of 5 Midwestern studies, and no South Central studies, provide monetary estimates of at least some of their benefits or impacts.

- An examination of data available from national organizations, e.g., Federal agencies and the American Red Cross, revealed that:
    - Most data classified by geographical region are presented by state and for the entire country. The most recent of these data are current.
    - A limited amount of data from these sources are available at the county or sub-county (e.g. city) level. The most recent of these data are often at least 18 months old.

- The primary sources of local or site specific data appear to be state and county, or sub-county (e.g. city), agencies and/or data collection efforts by research teams working in the field. Except for data collected by research teams, which may be current (e.g. water quality data), the remaining local data from state and local sources are often at least 18 months old.

- Reviewed studies which contain quantified estimates of benefits and impacts of surface mining and reclamation are characterized by:
    - the site-specific nature of their study areas;
    - their utilization of data collected in the field by members of their research teams;
    - their limited use of existing data bases for making benefit/impact assessments.

Specific Findings From Reviewed Research

A set of specific findings from the reviewed literature are presented here by selected benefit categories. It should be stressed that the reviewed research findings are specific to their studies and reflect conditions and assumptions associated with those studies. The findings presented here appear to have more general applicability, but any inferences drawn from them should be tempered with a review of the underlying studies and study procedures and conditions. To aid in such a review, studies associated with each finding are identified by index numbers contained in parenthesis; Exhibit 4.1 relates each number to it's corresponding study, by author and title. Complete citations appear in the Bibliography of this report.

EXHIBIT 4.1

REPORT SOURCES FOR SPECIFIC FINDINGS, BY IDENTIFICATION NUMBER

Report Identifier	Author/Title
1	J. Hardt, Albert Fritsch. Harlan County Flood Report
2	W.R. Curtis. Strip Mining Increases Flood Potential of Mountain Watershed (1972), Mimeograph (April 1977)
3	R.A. Bohm, et. al. The Economic Impact of Back-to-Contour Reclamation of Surface Coal Mines in Appalachia: The TVA Massengale Mountain Project
4	M. Dougherty, H. Holzen. Evaluation of Surface Mine Reclamation Techniques--Campbell's Run Watershed, Pennsylvania
5	William G. Adams, et. al. Surface Mine Pollution Abatement and Land Use Impact Investigation, Volume II, Watershed Ranking, Selection of Study Area, Analysis of Study Area
6	William G. Adams. Surface Mine Pollution Abatement and Land Use Impact Investigation, Volume III, Considerations of Post Mining Land Use, Mine Inventory and Abatement Plan for the Quicksand Watershed
7	Robert A. Bohm. Individual and Social Costs of Coal Mining
8	R.A. Bohm, et. al. A Progress Report on NSF/RANN Funded Research Related to Environmental and Economic Aspects of Coal Production
9	F.K. Schmidt-Bleek, J.R. Moore. Benefit/Cost Evaluation of Strip Mining in Appalachia: Statement Prepared for U.S. House of Representatives
10	J.P. Vimmerstedt, et. al. Effect of Strip Mining on Water Quality
11	R.M. Smith, et. al. Soil Development on Mine Spoil
12	R.J. Haynes, et. al. Environmental Impacts of Coal Extractions in Alabama: 1978-1985
13	J. Curry, D. Fowler. "Coal Strip Mining in Appalachia - Fish and Wildlife Considerations," Surface Mining and Fish and Wildlife Needs in the Eastern United States: Proceedings of a Symposium

EXHIBIT 4.1 (continued)

Report Identifier	Author/Title
14	F. Jernejcic. "Effects of Mining on Tygart Lake," *Surface Mining and Fish and Wildlife Needs in the Eastern United States: Proceedings of a Symposium*
15	Office of the Chief of Engineers, Department of the Army. *Demonstration Reclamation Project - Cabin Creek Project - West Virginia - Final Environmental Impact Statement*
16	L. Starnes, et. al. "Effects of Remedial Reclamation Treatments on Terrestrial and Aquatic Ecosystems—A Progress Report," *Surface Mining and Fish and Wildlife Needs in the Eastern United States: Proceedings of a Symposium*
17	G. Vaughan, et. al. "The Chronology and Character of Recovery of Aquatic Communities from the Effects of Strip Mining for Coal in East Tennessee," *Surface Mining and Fish and Wildlife Needs in the Eastern United States: Proceedings of a Symposium*
18	Alan Randall, et. al. *Estimating Environmental Damages From Surface Mining of Coal in Appalachia: A Case Study*
19	Argonne National Laboratory. *Land Reclamation Program Annual Report, 1978*
20	A.J. Fritsch, et. al. *Strip Mine Blasting: A Study of Vibrational Pollution in the Eastern and Midwestern Coal Fields*
21	E.S. Takle, D.L. Becker. *Analysis of the Fugitive Dust Problem Associated with the Surface Mining of Iowa Coal*
22	A.F. Agnew, D.M. Corbett. "Hydrology of a Watershed Containing Flood Control Reservoirs and Coal Surface Mining Activity, Southwestern Indiana," *Ecology and Reclamation of Devastated Lands, Volume I*
23	F. Munshower, D. Neuman. *Nutritional Value of Native Plant Species Growing on Old and New Mine Spoils*
24	Richard G. Walsh, et. al. *Option Values, Presentation Values, Recreational Benefits of Improved Water Quality: A Case Study of the South Platte River Basin, Colorado*
25	Edward H. Dettmann, et. al. *Effects of Coal Strip-Mining on Stream Water Quality: Preliminary Results*

EXHIBIT 4.1 (continued)

Report Identifier	Author/Title
26	W.R. Keefer, R.F. Hadley. *Land and Natural Resource Information and Some Potential Environmental Effects of Surface Mining of Coal in the Gillette Area, Wyoming*
27	W.A. Van Voast. *Hydrological Effects of Strip Coal Mining in Southeastern Montana - Emphasis: One Year Mining Near Decker*
28	W.P. James, et. al. *Potential Impact of the Development of Lignite Reserves on Water Resources of East Texas*
29	U.S. Army Corps of Engineers. *Digest of Water Resources Policies and Authorities*
30	Energy and Environmental Analysis, Inc. *Benefit/Cost Analyses of Laws and Regulations Affecting Coal. Case Studies on Reclamation, Air Pollution, and Health and Safety Laws and Regulations*
31	R.A. Minear, et. al. *Environmental Aspects of Coal Production in the Appalachian Region, Progress Report, June 1, 1978 - May 31, 1979*
32	Office of Surface Mining, U.S. Department of the Interior. *Permanent Regulatory Program Implementing Section 501(b) of the Surface Mining Control and Reclamation Act of 1977, Final Environmental Statement*

Water-Related Benefits and Environmental Impacts

1. Water Quality

- In areas with acid mine drainage (AMD) problems, reclamation of recently mined and abandoned lands has been shown to bring an improvement in the quality of AMD affected streams and rivers. These benefits, or improvements, in stream pH levels (or acid loads) were linked with successful revegetation, reclamation of abandoned mined areas, improved reclamation and regulation enforcement, and exposure of calcerous overburden. Improvements ranged from a 43% decrease in acid load to a 0.4 to 1.2 pH increase. (4, 14, 16)

- Water quality, as measured in terms of sediment load, metals content, and concentrations of various chemicals, is diminished when affected by surface mining in studied areas. Higher concentrations of sulfates, arsenic, cadmium, magnesium, and total metal content have been noted in mine-affected waters in various areas. (5, 8, 10, 16, 28) These mining impacts decrease with higher stream flows. (10, 12)

- Ground water affected by mine spoils in the eastern and western United States is in some cases of diminished quality when compared with unmined areas. Ground water moving through studied eastern spoils contained significant concentrations of cadmium, copper and chromium (spoils were not reclaimed under SMCRA) (8). Analysis of ground water moving through western spoils (reclaimed under 'strict' regulation) found ground water high in total dissolved solids and unfit for human consumption. (27)

- Reclamation of mined areas will decrease the sediment production in those areas, and a benefit in the form of improved water quality will result. The level of reduction in sediment production is shown to be dependent on the type of mine, terrain, soil type, and the type of reclamation performed. Two studies have noted that for some studied terrain and mine types, a 'highest' level of reclamation, AOC grading, does not effectively reduce the sediment production of mined areas below amounts associated with lower levels of reclamation. However, relating these results to anticipated reclamation results under SMCRA must take into account the procedures and assumptions of the previous studies, and the variety of reclamation procedures possible under SMCRA. (30, 31)

Other Hydrologic Conditions

- Surface mining has been linked to higher peak storm flows and shorter lag times (length of time required for a stream to respond to rainfall in its watershed). Disturbed watersheds (unreclaimed) have predictably higher storm flows and demonstrated shorter lag times (1,2)

- Effective reclamation of watersheds has been shown to improve hydrologic conditions relative to conditions in disturbed and unreclaimed watersheds. In addition to this benefit, studies show that effective reclamation can improve hydrologic conditions over those which existed prior to mining or in unmined areas. The hydrologic conditions used as indicators in these studies are storm flows, lag times, and dry period flows (or yields). Storm flows in the studied unmined drainages were nearly twice as high as those in mined and reclaimed drainages. (2, 15, 22)

- Property damage attributable to mine-related flooding and siltation in Appalachia has been estimated at $0.03 - $0.74 per ton of coal mined, or $1,249 - $1,795 per affected household. Based on these estimates, the maximum benefit which will accrue from flood and siltation control associated with effective reclamation will be in these ranges. (7, 8, 9, 18) The portion of a single flood's damage attributable to strip mining in a 300,160 acre area has been estimated at $3 million (1).

Land-Related Benefits and Environmental Impacts

1. Land Values

- The value of mined land is shown to increase following reclamation. In a study case, the market value of on-site land increased by 530%, and surrounding off-site land increased in value by 70-100%. (19)

- The impact of all damages associated with surface mining on the market value of land and buildings in a central Appalachian study area was estimated at $0.17 per ton of coal mined. (18)

2. Land Characteristics

- Mined areas in the western United States whose reclamation involved topsoil replacement support vegetation of greater nutritional value (for forage) than areas reclaimed without topsoil replacement. In addition, vegetation in topsoiled areas was found to be of greater nutritional value than that found in unmined areas. (23)

- Vegetation growing on 130 year old eastern, non-acid, unreclaimed mine spoils was found to be better forage when compared with vegetation growing on unmined areas. (11)

- In examining the impact of mining (without reclamation) on soils over a 130 year time frame, it was found that, (in a specific study area), in terms of selected physical characteristics (e.g. bulk densities, soil structure, organic content, water holding capacity, plant nutrient content), natural soils are superior in certain respects; mined soils are superior in others. (11)

- Chemical compositions of reclaimed mine spoils in Texas were found to be higher in concentrations of certain metals, e.g. copper, manganese, nickel, and zinc, than were chemical compositions of unmined areas. This result was for the study area; the chemical composition of other sites could be different. (28)

Fish and Wildlife-Related Benefits and Environmental Impacts

- Impacts of surface mining on fish and aquatic insect populations and habitats can be substantial. The severity of impacts will depend on conditions at the studied mine site and on the hydrologic conditions associated with affected areas. Levels of impacts for various geographic areas are given in the studies cited. (13, 16, 17, 31)

- Benefits to wildlife from reclamation have been shown in some studies. These benefits take the form of increases in the numbers of wildlife species observed, species populations, and improved wildlife habitats. (13)

- A natural recovery, with time, of mine-affected southern Appalachian aquatic habitats and fish and insect populations has been shown. Upon cessation of mining (with no reclamation), aquatic populations and habitats began to recover from drainages that occurred with mining. In a 25 year time frame, populations reached their pre-mining levels in terms of species diversity and population size. The study area was not affected by AMD, with sediment being the primary damage agent. (17)

  (Additional evidence of the natural recovery of ecological communities (in western mined areas) has been found by the Montana State University Agriculture Experiment Station, but is not yet published)

Other Benefit Areas and Environmental Impacts

Recreation

- Impacts of damage from surface mining on recreation related to fish, wildlife, and water were estimated at $0.03 per ton of coal mined for a central Appalachian region. (18)

- Recreation benefits resulting from projects generating increased recreational use ranged from $0.75 - $9.00 per day of use. The actual value of benefits depends on the type of recreation involved. The values given here represent ranges for projects in all parts of the nation. (29)

- For a western study region with one major river and population center, the recreational and aesthetic benefits resulting from the alleviation of severe water pollution - not necessarily surface coal mine specific-were estimated. The benefits range from $9.8 million to $26.4 million per year, depending on the benefit estimation technique used. (24)

Aesthetics

- A central Appalachian study estimated the regional benefit resulting from aesthetic improvement (reclamation-related) at $0.16 to $8.90 per ton of coal mined. (18)

Socio-Economic Impacts

Socio-economic impacts of extensive mining (without effective reclamation) on study regions in Appalachia were identified. Specific impacts were:

- An inverse relationship was found between the level of coal output and level of agricultural output.
- Sociological conditions were degraded by mining activity (e.g. a deterioration in community conditions).
- An inverse relationship appeared to exist between farm and mining income in counties with mining.

These impacts were not directly related to a lack of reclamation, and the level to which reclamation would relieve these impacts was not shown. (8, 9)

AREAS OF RESEARCH DEFICIENCY FOR ASSESSMENTS OF SMCRA

Based on the current review of relevant research and data sources, it appears that information needed to make comprehensive, defensible assessments of impacts related to SMCRA, at the state, regional (i.e., multiple states), or national level, does not currently exist. Among the areas of research deficiency that confront such assessments are:

- The lack of research that addresses specific aspects of SMCRA, and the inability to associate many existing research findings directly with the Act. The difficulties encountered in linking SMCRA with these findings are not surprising, in that much of this research was completed under pre-Act operating conditions.
- While many of the socio-economic and environmental impacts/benefits associated with SMCRA will evolve over time, the Act has been in operation for less than three years. It is therefore premature to expect that many of these impacts/benefits will manifest themselves, in mature form, at this time.

- Existing data from national level data sources are largely unavailable at the site-specific or local levels. Since assessments of many of SMCRA's impacts/benefits are most appropriately conducted at such levels, much data from these sources are of limited value for impact/benefit assessment purposes.

- While local level and some site-specific data are available, often from county or state sources, such data are often 18 to 24 months old. The most recent of these data would, therefore, be related to 1978 and not really reflect SMCRA's operating environment.

- The availability of existing data, at any geographic level, is not uniform across impact/benefit areas. In some instances, e.g., agriculture, data are relatively plentiful. In others, e.g., the destruction of fragile or historic lands, virtually no data exist. Data availability for many impacts/benefits lie between these extremes.

- The assessment of many of SMCRA's environmental impacts would require that site-specific or local level environmental data be available that reflect pre-SMCRA operating conditions (comparison of pre- and post-SMCRA conditions would often permit assessments to be made of the Act's impacts; knowledge of such impacts would then serve as a basis for benefits estimation). Unless a geographic area has been subjected to environmental investigations, these data are usually not available.

- Investigations of SMCRA's impacts/benefits are hindered by a lack of thorough knowledge of the reclamation processes that would generate them. A certain amount of research has been conducted in a limited number of subject areas (e.g., research into the effectiveness of various revegetation programs); other, more comprehensive, research efforts are underway, but their results are not yet available.

- While evaluations of socio-economic and/or environmental impacts/benefits related to SMCRA are conducted by many groups across the nation, the lack of communication or cooperation between these groups has led to duplicated effort being expended in some areas and virtually no effect being devoted to others.

In view of these deficiencies, attempts to assess SMCRA at the state, regional, or national level will be difficult, and their results, at best, will be tenuous.

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Economic study disappoints OSM

The Office of Surface Mining has returned to the drawing board, frustrated in its attempts to elicit industry cooperation in a cost-benefit analysis of the 1977 strip mine act.

OSM's Division of Planning and Evaluation contracted a consulting firm to conduct a year-long study of the effects of the act based on operators' experience and data. The division believed it could, through a third, impartial party, accumulate enough information to complete the study. But the firm failed to convince 16 major and minor operators to help, due to the "proprietary and confidential" nature of the information, according to the final report.

In the end the study served as a review and assessment of available research on the impacts of surface mining, land reclamation, existing data sources and the act itself. In a final recommendation the study suggests OSM in the future consider seeking the aid of an industry trade association such as the National Coal Association to help it gather the necessary statistics.

"We need to try to monitor the economic adjustment of the industry as we move into permanent programs," said an OSM official who worked on the project. He said Interior Secretary James Watt, likely will place a stronger emphasis on similar economic analyses.

Coal-haul roads bill re-introduced

Rep. Virginia Smith, R-Neb., has re-introduced in the House a bill to provide federal assistance to energy-impacted roads and railroads.

Similar bills were approved by both houses in the 96th Congress, but died late in the session when conferees were unable to work out differences over some controversial aspects of the measure *(CO 12/22/80)*.

The new measure would provide $250 million for cost-sharing funds for improving coal-haul roads and railroads for safety purposes. It would increase that amount by $50 million each year for five years.

The money would come from the windfall profit tax, under the proposal, with federal sources paying 80% of safety improvements. The bill would prohibit any state from receiving more than 12% or less than .5% of the total appropriation for any year.

The money would be used for projects "to alleviate the environmental, social and economic impact of increased coal train traffic." Rep. Smith essentially wants that part of the bill to improve railroad grade crossings and build grade separations.

Some of the money also would be used to "reconstruct, resurface, restore and rehabilitate non-toll public roads" affected by increased energy transportation.

Correction

Due to incorrect information from a source, a story in the Jan. 19 issue of *Coal Outlook* said John Hernandez of New Mexico was getting considerable support from Sen. Pete Domenici, R-N.M., for appointment to head the Office of Surface Mining. Domenici, in fact, recommended Hernandez to head the Environmental Protection Agency.

Panel sees no clean air/energy conflict

The Clean Air Act in its current form should not impede coal and other energy development in the West for at least the next decade, the staff of the National Commission on Air Quality said last week.

But the commission staff warned in a draft report that increased surface mining of coal in the Southwest could affect visibility in pristine federal lands unless currently unregulated mine emissions are controlled. The draft will provide the foundation for a final commission report to Congress March 1.

The final report is expected to have a substantial impact on the congressional review of the law this year *(CO 1/12)*. The 13-member commission, chaired by Sen. Gary Hart, D-Colo., began meeting behind closed doors over the weekend to forge final recommndations to Congress, but the commissioners aren't expected to conclude their deliberations until Feb. 15.

The staff draft appears to agree in some ways but disagree in many others with recent National Coal Assn. proposals for revising the air law. Both the staff and NCA suggest the law could be simplified and streamlined in several ways — particularly in the prevention of significant deterioration (PSD) program.

But NCA sees unavoidable energy/environment conflicts, while the commission draft says PSD "is not expected to limit energy development in major energy production areas" studied by commission consultants. For example, the draft says the Four Corners region (Utah, Colorado, New Mexico and Arizona) could accomodate "quadrupled surface mining of coal" plus 10 coal gasification plants and 1.5 million bbl/day of shale within current air quality constraints.

The draft cautions that increased surface mining in the region could cause visibility problems, which could be worsened by new coal-fired power plants. The draft says it is "not now possible" to draw conclusions about current visibility policy because states are given power to override federal land manager rulings on air quality impacts.

The draft agrees with NCA that PSD increments may not be needed except to protect pristine Class I lands but it diverges sharply on the acid rain issue. NCA asserts there is no proven connection between combustion sources and acid rain, but the commission draft links the two, adding there is "compelling evidence" that the phenomenon has killed large numbers of fish in the U.S., Canada and Europe.

The draft warns that acid rain is "likely to become more severe" in future years unless new controls are required, and it suggests several ways to tackle the subject *(CO 1/12)*.

A 67-page NCA briefing book outlines positions approved by the association's board of governors late last year. NCA asserts that it doesn't intend to "gut" the law, but its list of proposals includes controversial plans to require that health-based federal air quality standards protect only against "significant adverse health effects," and that the standards should permit an "acceptable risk" of damage.

Severance tax ceiling re-introduced

The coal severance tax issue is expected to simmer again in Congress this year, with one Senate bill clamping a 12.5% tax lid already introduced and a similar measure expected in the House.

Sen. David Durenberger, R-Minn., introduced last week the bill for a 12.5% ceiling on coal produced from federal lands, claiming high severance taxes add almost $2 per ton to U.S. coal prices.

On the House side, an aide to Rep. Philip Sharp, D-Ind., said it is

Black lung payments soar

Payments to black lung victims and their dependents totaled a record $1.44 billion in 1979 and 1980, former Labor Secretary Ray Marshall told Congress in his final annual report on the Black Lung Benefits program.

That figure represents 93% of the approximately $1.55 billion in benefits paid by the Labor Dept. since it began handling the program in 1973.

Marshall said the Department had dispensed with a backlog of some 241,000 undecided cases since January 1979. By the end of 1980, fewer than 43,000 were still awaiting an initial determination.

In his report Marshall said the Black Lung Disability Trust Fund was groaning under a $955.3 million deficit, adding that the Department is studying new ways to balance the fund.

A 1980 study by the General Accounting Office warned that the federal government would face massive annual contributions to the fund in coming years, amounting to between $500 million to $1 billion.

EPA loosens "bubble" policy

Environmental Protection Agency staffers predict more coal-fired industries may be able to adopt more flexible emissions standards as a result of changes in the agency's so-called "bubble" policy. As one of his final actions, former EPA Administrator Douglas Costle endorsed changes in the policy which would permit plants in high-pollution "nonattainment" areas to use the policy for sulfur dioxide or particulate pollution.

The bubble policy generally permits plants to increase emissions from one polluting source as long as it makes sure overall emissions from the plant or nearby plants don't increase.

EPA noted it also would consider endorsing a key regulatory change that would exempt removal of or failure to replace control equipment like scrubbers as part of a bubble from complex requirements applying to new plants *(CO 10/27/80)*. EPA noted this change might require an amendment to the Clean Air Act.

East Coast ports see banner years

The booming interest in U.S. steam coals for export coupled with unexpected demand for metallurgical coal in 1980 produced record or near-record years for the three major East Coast coal ports.

The Chessie System, which operates both the Curtis Bay terminal in Baltimore, Md., and C&O Coal Piers in Newport News, Va., reported 32,637,570 tons of coal shipped through both facilities in 1980. Curtis Bay's 13,898,622 tons was a record for Baltimore.

Port of Baltimore officials said last year's coal-handling total was the largest movement of a single commodity there in 15 years.

Chessie's Newport News total was 18,738,948 tons, the best year since 1957, when nearly 27 million tons of coal moved through the facility.

Norfolk & Western, operator of Lamberts Point in Norfolk, Va., said it moved 31.9 million tons of coal through the facility last year. It was NW's best year since 1970, when a record 34.5 tons moved through Lamberts Point.

uncertain now if Sharp or another congressman will pick up Sharp's bill introduced last session that proposed a 12.5% ceiling on severance taxes for all coal.

Sen. Malcolm Wallop, R-Wyo., and other western state senators were drawing up late last week angry opposition statements and strategy for demise of the bills.

A group of U.S. representatives, members of the Northeast-Midwest Congressional Coalition, took another mode of attack last week, filing a friend-of-the-court brief in the Montana severance tax case pending before the U.S. Supreme Court *(CO 12/15/80)*.

Filing in opposition to the state of Montana and its 30% coal severance tax, the coalition announced at a Capitol Hill press conference it intervened "because severance taxes threaten an energy war between the states."

The brief argues if the nation's high court allows to stand the Montana Supreme Court decision upholding the state's severance tax, "These coal-rich states will be free to increase the tax by 100%, 1000%, or any amount they please."

The case, Commonwealth Edison v. the State of Montana, is not expected to be heard for several months.

The coalition, an alliance of more than 200 members of Congress from 18 Northeastern and Midwestern states, claims Montana is reducing its own property, income and excise taxes by the more than $60 million a year flowing in from other states paying the severance tax.

A recent report from the House Energy Committee, drawn up to back Sharp's bill during the last session, maintains excessive severance taxes reduce coal production and block national energy goals.

The report argues Montana's 30% and Wyoming's 17.5% tax gouge energy consumers while totalling several times more than the direct and indirect costs of coal production impacts.

The study said long-term contracts for Montana coal dropped severely after the state's high tax was passed. It cited a growth rate decline to 18.5% in 1976, while the annual growth rate in state coal production in 1975 before the tax was 61.5%.

ICF rates acid rain strategies

An acid rain control strategy designed to roll back utility sulfur emissions east of the Mississippi by 10% or 30% would be more cost effective and generally would cause fewer coal supply disruptions than a tighter uniform emission standard for existing power plants, according to a preliminary report prepared by ICF Inc. for the Environmental Protection Agency and the Energy Dept.

The report, sent by EPA last week to Sen. Robert Stafford, R-Vt., chairman of the Senate Environment Committee, and Rep. Henry Waxman, D-Calif., chairman of the House Energy and Commerce subcommittee on health and environment, rates some but not all of EPA's suggested approaches to controlling acid rain. New legislation would be required before any of the hypothetical control strategies could be put into place *(CO 12/8/80)*.

ICF projects nationwide utility sulfur emissions of 18.9 million tons by 1990 without new controls, with 17.1 million tons east of the Mississippi alone. Reducing total Eastern emissions by 10% — presuming some states would reduce emissions more than others — could be done at a cost of about $50 per ton of sulfur removed. But the same plan would displace about 15 million tons per year of coal in the Midwest while increasing central

EPA proposes emission tightening

The Environmental Protection Agency last week proposed tightening sulfur emission standards slightly at the coal-burning Orrville (Ohio) Municipal Power Plant and at the Portsmouth Gaseous Diffusion Plant in Pike County, Ohio.

EPA said the action was taken in response to a 1978 federal appeals court decision ordering EPA to re-examine certain areas of the state to make sure they could meet federal ambient air quality standards. The Orrville plant's emission standard would drop from 7.0 lbs/million Btu to 6.63 lbs/million Btu under the proposal, while the Pike County facility would drop from 7.0 lbs/million Btu to 6.16 lbs/million Btu.

The agency said it would accept comments on the proposal until Feb. 23, and it might also hold a public hearing.

Ohio utilities settle pollution case

Ohio Edison Co. and two other utilities agreed last week to pay $1.5 million in civil penalties and to install $500 million worth of pollution control equipment at 10 plants to settle a Justice Dept. suit.

The agreements, all involving control of particulate emissions, were contained in two consent orders filed in U.S. District Court in Columbus, Ohio.

Ohio Edison was joined by Duquesne Light Co. and an Ohio Edison subsidiary, Pennsylvania Power, in paying what Justice said was the largest penalty ever paid by a utility under the Clean Air Act. An Ohio Edison spokesman noted that $400 million would be spent installing baghouse filters and electrostatic precipitators at its Sammis plant, but he added that the settlement would not cause the utilities to change coal suppliers.

Kaiser Resources becomes BC Coal

Kaiser Resources Ltd. of Vancouver, B.C., a subsidiary of British Columbia Resources Investment Corp., has changed its name to B.C. Coal Ltd.

A major Canadian coal exporter, the firm also will become a private corporation Feb. 19 with its redemption of 141,893 publicly-held shares, .8% of the company's shares.

DOE proposes fuel switch for Tucson

Tuscon Electric Power Co. plans to use coal at its Irvington Generating Station, but won't be scouting for a producer.

The utility plans to develop its reserves in the Gallo Wash area of northwest New Mexico to service both Irvington and the new Springerville plant in eastern Arizona.

Tuscon Electric is under a proposed Energy Dept. order to use natural gas or oil and coal in Irvington's four units. It's the first DOE order permitting a mixture of fuels, rather than complete substitution of an alternative for oil or natural gas.

Company officials had no exact projections on the coal use for the 420-Mw Irvington plant, but anticipate beginning conversion to coal in 1985.

The proposed DOE order, still pending final review, would switch Tucson Electric to coal during low load periods, and permit oil or natural gas for peak demand periods.

Appalachian production by 6 million tons/year and increasing Western coal shipments to the East by 8 million tons/year.

A 30% rollback would cost about $170 per ton removed and would displace 25 million tons/year of Midwestern coal by 1990. But the same plan would increase central Appalachian production by 28 million tons/year, increase Western coal shipments to the East by 17 million tons/year and increase overall coal production by about a million tons/year, ICF projects.

By the same token, a uniform 4 lb./million Btu sulfur dioxide standard for existing utilities would achieve about the same degree of sulfur reduction as a 10% rollback, but would cost more than four times as much and would have a larger impact on high-sulfur Midwestern production. A tighter 2 lb./million SO_2 limit would achieve somewhat greater control than a 30% rollback, but would cost nearly three times as much and also would have a more disruptive impact on Midwestern production.

At EPA's request, ICF also examined several strategies designed to reduce sulfur emissions yet avoid cutting coal production in any region beyond that anticipated in 1985. Under this sort of "scenario," ICF found that a 30% rollback in Eastern emissions would still be more cost-effective than a 2 lb./million Btu emissions ceiling, but it noted that the former plan also would be more disruptive to anticipated coal supply patterns.

ICF currently is examining other plans aimed at dealing with sulfur emissions through some sort of emissions tax or through using the innovative "LIMB" burner process *(CO 1/19)*, and expects to compile a more complete report within several months.

Stafford reaffirms acid rain study intent

Sen. Robert Stafford, R-Vt., the new chairman of the Senate Environment Committee, reaffirmed last week that the committee would consider the need for new acid rain controls during its review of the Clean Air Act this year.

But Stafford, who described himself as a "pragmatist," noted he would avoid a prolonged, quixotic battle on the issue if he lacks the votes to win.

Stafford's resolve on the controversial acid rain issue was called into question by remarks he made the previous week at a conference hosted by Burson-Marstellar, a Washington, D.C., public relations firm. James Bishop, an official with the firm, quoted Stafford as saying he didn't want to deal with acid rain as part of the clean air review, and that it should be handled in separate legislation, if at all.

The senator's remarks, confirmed by his press secretary, alarmed environmental activists, who want amendments to the air act giving the Environmental Protection Agency new authority to reduce sulfur and nitrogen oxide pollution. By late last week, Stafford appeared to have modified his position.

Stafford told *Coal Oulook* in an interview that the committee definitely "will take a look at" the acid rain issue in Clean Air Act hearings tentatively slated to begin in March "to see if that needs legislation." Stafford said the committee might consider requiring new controls "if evidence is there" that sulfur and nitrogen oxide emissions "into the very high atmosphere" are increasing acid rain.

But he quickly added "we'll be trying to get to middle ground" politically on this and other issues. "I don't believe in trying to do something that's simply impossible." Stafford said he couldn't recall exactly what he said at the earlier seminar, but he said he wanted the audience to know that he "didn't intend to pick a needless fight" if he couldn't win.

Capitol Hill sources said Stafford had become pessimistic about the prospects for new acid rain controls after being badly beaten last year on the

Sierra Club sues utilities over SO_2

The Sierra Club has followed up an earlier threat by suing four Indiana utilities for what the environmental group charges are sulfur dioxide emissions in violation of the state's air quality improvement plan (SIP).

The suit, filed in U.S. District Court in Indiana, alleges violations from Indiana-Kentucky Electric Coop.'s Clifty Creek station, Northern Indiana Public Service Co.'s Bailly plant, Southern Indiana Gas & Electric Co.'s Warrick station and Indiana & Michigan Electric Co.'s Tanner's Creek plant.

The environmental group threatened to sue these and other plants last year *(CO 9/22/80)*. A Sierra Club spokesman said the group might bring additional suits soon. The affected companies have 20 days to respond to the suits.

AAR intervenes in rail suit

The Association of American Railroads has filed to intervene in opposition to Texas' challenge to certain market dominance, ratemaking and state regulation provisions of the 1980 Staggers Rail Act.

The AAR argued in its filing in U.S. District Court against invalidation of the Rail Act provisions on interstate rail rates and the limited role of states.

UMW district sues EPA on air

Frustrated with the Carter administration's air pollution policies for Ohio *(see related story, page 1)*, the United Mine Workers District 6 filed suit against the Environmental Protection Agency last week in U.S. District Court in Columbus, Ohio. The Jan. 21 suit demands that EPA take quick action in revising federal air quality standards for sulfur dioxide and take advice from a "blue ribbon" industry-selected panel of scientists *(CO 9/22/80)*.

A district spokesman said the suit was designed to "remind" the Reagan administration that several thousand Ohio mine workers remain unemployed. The district threatened the suit last October, but then delayed it in return for an election-eve deal cut with the White House *(CO 11/3/80)*. The Carter administration then appeared to renege on the deal.

Consortium complete for Baltimore pier

Six companies have sealed plans for a consortium to buy 500 acres along the outer Baltimore harbor and construct a 15 million tons/year coal export pier *(CO 12/22/80)*.

Joining the project in addition to New York engineering firm Soros Associates, Oklahoma-based coal producer Mapco Inc., and Sun Oil Co. subsidiary Elk River Resources Co. are: The Pittston Co.; Old Ben Coal Co., a Standard Oil Co. (Ohio) subsidiary and Utah International Inc., a unit of General Electric Co.

A Soros spokesman said the consortium is negotiating the land purchase from CSX Corp., a Richmond, Va.-based railroad holding company, and hopes to obtain $150 million in tax-free revenue bonds for financing.

The coal-loading facility would be served by Chessie System's Baltimore & Ohio Railroad. It is to be located in the Marley Neck section of Anne Arundel County at the Patapsco River.

The proposed pier, adjacent to the Brandon Shores plant of Baltimore Gas & Electric Co. would begin operations in about 1985.

Senate floor while trying to add acid rain provisions to the oil backout bill *(CO 6/30/80)*. But sources said other senators, including Sen. George Mitchell, D-Me., would make a strong push for new acid rain authority under the Clean Air Act.

If Stafford's ambivalence on this issue has dismayed some environmentalists, his remarks won't give much consolation to coal industry officials who want the current law relaxed. Stafford told *Coal Outlook* he believes there is "broad public support" for the law's goals, and that this year's congressional review would be "more an effort in fine tuning the program" than in making substantial changes.

East Coast exports see seasonal drop

With the onset of winter and coal production slowed by the Holiday season, exports from the three major East Coast coal ports dipped to 4,484,958 long tons in December.

Reports from customs house brokers W.M. Stone & Co. of Norfolk, Va., and John S. Conner Inc. of Baltimore, Md., showed December's totals dropped more than 500,000 tons from November's corrected 5,048,573.

But tonnages from Lamberts Point in Norfolk, the Chesapeake & Ohio Coal Piers in Newport News, Va., and Curtis Bay in Baltimore were more than 1 million tons ahead of the 3,274,943 tons shipped through the ports in December 1979.

East Coast Exports
(long tons)
December 1980

Company	Baltimore	Newport News	Norfolk	TOTALS
Pittston	105,931	53,273	435,723	594,927
A.T. Massey	--	236,242	306,032	540,274
Island Creek	188,432	157,065	172,477	517,964
Consolidation	--	83,275	275,147	358,422
CC&B (incl. Eastern)	--	48,710	254,101	302,811
Anker	30,275	71,858	112,380	214,513
Jno. McCall	110,053	56,091	41,687	207,831
Thyssen	43,118	28,359	122,344	193,821
Sprague	--	181,356	--	181,356
SSM	34,678	-	141,052	175,730
Foreston	28,714	28,465	69,920	127,099
G&W Carbomin	55,256	51,986	--	107,242
Coal Trading	50,989	39,452	--	90,441
Watson	--	80,448	--	80,448
Primary	--	74,867	--	74,867
PBS	74,787	--	--	74,787
Derby	--	20,197	48,070	68,267
Alla-Ohio Valley	--	51,341	7,361	58,702
John K. Irish	--	45,149	5,008	50,157
Mapco	33,693	14,843	--	48,536
Scallop	48,144	--	--	48,144
Powellton	--	43,515	--	43,515
Coalerbed	--	28,182	11,917	40,099
Summers	36,510	--	--	36,510
Calvert	--	29,646	--	29,646
United Eastern	29,467	--	--	29,467
Dover	--	--	28,278	28,278
Armco	--	25,244	--	25,244
Fetteroff	23,672	--	--	23,672
Barber Paramont	--	--	22,256	22,256
Virginia Iron Coal and Coke	--	--	19,982	19,982
Newera	--	19,031	--	19,031
Neris	18,755	--	--	18,755
Stinnes	--	17,989	--	17,989
United Coal	--	--	8,522	8,522
Amerope	--	--	7,914	7,914
Totals	912,464	1,485,323	2,087,171	4,484,958

DRAFT

ECONOMIC ASSESSMENT OF THE IMPACT ON COAL PRODUCTION DUE TO ENFORCEMENT OF THE SURFACE MINING CONTROL AND RECLAMATION ACT OF 1977

BENEFITS SECTION OF DRAFT FINAL REPORT

August 7, 1980

Contract Number J5191111

Prepared for:

Department of the Interior
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  and Enforcement
Division of Planning and Evaluation
Washington, D.C. 20240

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CHAPTER I

INTRODUCTION

I. INTRODUCTION

BACKGROUND

This report has been prepared as part of a study that The Orkand Corporation is conducting for the Office of Surface Mining Reclamation and Enforcement (OSM), U.S. Department of the Interior, under Contract Number J5191111. This study is entitled "Economic Assessment of the Impact on Coal Production Due to Enforcement of the Surface Mining Control and Reclamation Act of 1977." As suggested by its title, the study is intended to assess the major economic benefits and costs that are associated with the enforcement of the Surface Mining Control and Reclamation Act (SMCRA), which is administered by OSM. This report addresses the benefits of surface coal mining and land reclamation that follow from the Act; consideration of SMCRA's compliance costs is deferred to a separate report.

As originally conceived, the study was to evaluate, preferably in quantitative and monetary terms, the specific benefits and socio-economic impacts of SMCRA. However, it was apparent, in the course of the initial analysis, that historical evaluation of specific benefits and socio-economic impacts is complicated by the short time that SMCRA has been in operation. It was also apparent that development of substantive, and defensible, quantified estimates of benefits and impacts is hindered by the absence of a great deal of needed input data, and by an incomplete understanding of the impacts of ~~reclamation~~ ~~processes~~ practices that the Act ~~is intended to enhance.~~ and regulatory regime.

Rather than attempt to evaluate specific benefits and socio-economic impacts, OSM and The Orkand Corporation decided that the following are more appropriate goals for this study:

- Evaluate the state-of-the-art of research on the impacts of surface mining, land reclamation, and SMCRA.
- Identify and evaluate opportunities for future research on the impacts of SMCRA.

To accomplish these goals, the study team has: identified and reviewed existing studies that address surface mining, land reclamation, and/or SMCRA; identified groups that have been active in this research; identified and reviewed existing data bases of potential value to assessments related to SMCRA; discussed the Act, its impacts, and the estimation of these impacts with Federal and state agencies, and with other organizations who potentially have an interest in SMCRA-related matters; and visited surface mining regions to obtain the views of mine-affected groups as they relate to mining, reclamation, and SMCRA. The subsequent chapters of this report describe these efforts, and present major findings and recommendations.

REPORT ORGANIZATION

This report is organized into the following seven chapters, of which this is the first:

Chapter I: Introduction

Chapter II: Review of the Status of Research on the Benefits and Socio-Economic Impacts of Surface Coal Mining and Reclamation

Chapter III: Review of Known Data Bases and Other Information Sources Potentially Relevant to SMCRA-Related Assessments

Chapter IV: Summaries of Communications with Government Agencies and Research Organizations Involved with Surface Coal Mining, Land Reclamation, and Other SMCRA-Related Topics

Chapter V: Summaries of Information-Gathering Trips to Coal-Producing Regions in Montana and Tennessee

Chapter VI: Findings and Conclusions

Chapter VII: Recommendations for Future SMCRA-Related Research.

With the exception of Chapter II, the contents of the chapters are clearly indicated by their titles. Chapter II describes and summarizes our review of a sample of existing studies; summaries for these studies appear in Appendix 1.

In the discussions of information sources in Chapters II through V, references to specific persons and mining companies have been omitted. These omissions are deliberate, and are based on the premise that communication with these parties was conducted for the purpose of gaining information and not for attribution. Given the controversy that surrounds SMCRA and its regulations, it is unclear how many of the parties would have been willing to cooperate if they were to be identified.

It should be noted that the views ascribed to an agency or organization are those of its contacted spokesmen. While many of these views undoubtedly reflect sentiments that exist within the contacted groups, they are not necessarily the official positions of the agency or organization and should be interpreted accordingly. This lack of official certification should in no way diminish, however, the usefulness of the views.

CHAPTER II

A REVIEW OF THE STATUS OF RESEARCH ON THE BENEFITS AND SOCIO-ECONOMIC IMPACTS OF SURFACE COAL MINING AND RECLAMATION

II. A REVIEW OF THE STATUS OF RESEARCH ON THE BENEFITS AND SOCIO-ECONOMIC IMPACTS OF SURFACE COAL MINING AND RECLAMATION

PURPOSE

The purpose of this chapter is to determine the status of investigations into: the social, economic, and environmental impacts associated with surface coal mining and reclamation; and the benefits that result from SMCRA and similar legislation and regulations. To accomplish this end, studies were reviewed to:

- Identify benefits and impacts that have been addressed by the research community
- Determine the state of knowledge that is associated with each benefit and impact
- For quantifiable benefits and impacts:
  - determine the units of measure employed
  - review and evaluate the estimating methodologies employed
  - review numerical estimates, when available
- For non-quantifiable benefits and impacts, summarize the state of knowledge that is associated with each benefit and impact.

Initially, emphasis was placed on identifying (and reviewing) benefits and impacts that are related directly to SMCRA. As the review progressed, and contacts were made with the research community that is involved in surface coal mining, it became clear that too little time has elapsed since the Act's passage to permit many assessments to have been made. Because of this, emphasis was shifted to benefits and impacts that are associated with the more general topics of surface mining and reclamation.

Rather than being treated as a form of "negative" benefit, the direct costs related to reclamation are virtually ignored in this chapter (and report). They will be addressed in the study's cost report, to be submitted later under separate cover. The reviews contained in this chapter provide a representative sample of research on benefits and impacts that has been completed to date. Use of these reviews will mitigate against the possibility of pursuing benefit/impact investigations that have already been thoroughly explored. The reviews will also help to identify those areas in greatest need of research.

SCOPE

Published research on the potential benefits and impacts of coal mine reclamation is extensive but fragmented. Fragmentation appears to have occurred because:

- Many groups have worked in the field but are not, in numerous instances, aware of each other's activities.
- Certain benefits and impacts have been subjected to extensive, often repetitive, research; other benefits and impacts have been virtually ignored.

Because the literature is fragmented, efforts were concentrated on identifying a representative, and reasonably comprehensive, sample of studies. The selected sample, while by no means exhaustive, is believed to contain many of the significant studies in the field that have been completed to date. Ongoing research, for which published reports are unavailable, is not represented in this sample.

In selecting studies for review, three criteria were employed:

- At least one study addressing reclamation benefits and impacts would be chosen for each coal producing region in the country.
- As wide a range of benefits and impacts as possible would be addressed by the selected sample.
- Only studies completed after 1970 would be reviewed. It was felt that this restriction would disqualify very few significant studies, and would facilitate the identification of relevant studies in the shortest amount of time.

Actual studies were identified on the basis of:

- Communications with federal and state agencies who are involved with surface coal mining and related land reclamation
- Communications with organizations doing research in surface coal mining and land reclamation
- Publications lists produced by agencies doing research in surface coal mining and land reclamation
- Bibliographies of published materials that are relevant to surface coal mining, land reclamation, and/or environmental protection.

Citations for the publications lists and bibliographies appear in Exhibit 2.1; oral and written communications with various public and private agencies are discussed in Chapter IV. Special efforts were made to obtain reports that were specifically recommended by researchers active in the field.

EXHIBIT 2.1

BIBLIOGRAPHIES AND PUBLICATIONS LISTS UTILIZED IN SELECTING STUDIES

BIBLIOGRAPHIES:

Gleason, V.E. Coal and the Environment Abstract Series, Bibliography On Mined-Land Reclamation. Report prepared by Bituminous Coal Research, Inc., Monroeville, Pa., for the Resource Extraction and Handling Division, Industrial Environmental Research Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio. Report Number EPA-600/7-79-102, April 1979.

National Technical Information Service, U.S. Department of Commerce. Strip Mining, Citations from the NTIS Data Base. Report Number NTIS/PS-760810. October 1976.

National Technical Information Service, U.S. Department of Commerce. Strip Mining, Volume 2. 1976 - September 1978, Citations from the NTIS Data Base. Report Number NTIS/PS-78/1164. November 1978.

Patricoski, Marian L., et al. A Selected Bibliography of Surface Coal Mining and Reclamation Literature, Volume 2, Interior Coal Province. Prepared by Argonne National Laboratory, Argonne, Illinois. Report Number ANL/LRP-1. August 1979.

Ralston, S., et al. The Ecological Effects of Coal Strip-Mining: A Bibliography With Abstracts. Report prepared by the National Resource Ecology Laboratory, Colorado State University, Fort Collins, Colorado, for the Western Energy and Land Use Team, U.S. Fish and Wildlife Service, Fort Collins, Colorado. Report Number FWS/OBS-77/09, March 1977.

Weiss, Nancy E., et al. A Selected Bibliography of Surface Coal Mining and Reclamation Literature, Volume 1, Eastern Coal Province. Prepared by Argonne National Laboratory, Argonne, Illinois. Report Number ANL/LRP-1, November 1977.

AGENCIES PROVIDING PUBLICATIONS LISTS:

Energy, Environment, and Resources Center
The University of Tennessee
329 South Stadium Hall
Knoxville, Tennessee 37916
(615) 974-4251

Energy and Environmental Systems Division
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439
(312) 972-3725

EXHIBIT 2.1 (Cont'd)

Environmental Policy Institute
317 Pennsylvania Avenue, S.E.
Washington, D.C. 20003
(202) 544-8200

Montana Bureau of Mines and Geology Publication
Montana College of Mineral Science and Technology
Butte, Montana 59701
(406) 792-8321 - EXT 245

Tennessee Valley Authority
Division of Forestry, Fisheries, and Wildlife Development
Norris, Tennessee

The Environmental Institute
Blaisdell House
University of Massachusetts
Amherst, Massachusetts 01003

U.S. Environmental Protection Agency
Office of Research and Development
Washington, D.C.

Fish and Wildlife Service
U.S. Department of the Interior
Washington, D.C.

U.S. Geological Survey
(See Montana Bureau of Mines for
address and phone number)

REVIEWED STUDIES

A sample of 66 studies was selected for review. These studies were classified, according to their geographical study area, into the following regions:

- National
- Appalachia
- Midwest
- West
- South Central

Exhibit 2.2 lists the states included in each region.

The number of reviewed studies falling in each region is presented in Exhibit 2.3. Based on the bibliographies examined, this geographical distribution of the reviewed studies is reasonably representative of the overall research that has been conducted to date.

A summary of each reviewed study is provided in Appendix 1. Each summary consists of three parts:

- Complete bibliographic citation. This includes the author, title and date of the report, the source, the stock order number (whenever available), and the geographic study area addressed.
- Tabular summary of benefits and socio-economic or environmental impacts that are addressed in the study. Wherever possible, this section identifies the analytical methods that were used in addressing each benefit or impact, and the units of measure that were employed when quantification was possible. Results of the investigation, whether qualitative or quantitative, are given.
- A Comments Section. This section contains findings of the report that cannot be readily presented in tabular form. Also included, when appropriate, is the reviewer's evaluation of the relevance of the report to economic assessments of topics related to SMCRA.

The bibliographic and comments sections are presented for every reviewed study. The tabular summary for benefits and impacts is provided whenever a report's findings are amenable to this form of presentation.

Because they are quite extensive, the summaries of the reviewed studies appear in an appendix and not in the main text. This form of presentation is designed to maintain continuity in the text and should in no way detract from the importance of the summaries; readers unfamiliar with research in the field would profit greatly from even a cursory examination of the summaries.

EXHIBIT 2.2

DEFINITION OF STUDY REGIONS BY STATE

National:	All coal-producing states in the United States	
Appalachia:	Alabama	Pennsylvania
	Georgia	Tennessee
	Eastern Kentucky	Virginia
	Maryland	West Virginia
	Ohio	
Midwest:	Illinois	
	Indiana	
	Western Kentucky	
West:	Arizona	North Dakota
	Colorado	Utah
	Montana	Washington
	New Mexico	Wyoming
South Central:	Arkansas	Missouri
	Iowa	Oklahoma
	Kansas	Texas

EXHIBIT 2.3

REGIONAL DISTRIBUTION OF REVIEWED STUDIES

	Number of Studies	Percent of Total
National	12	18.1%
Appalachia	30	45.5
Midwest	5	7.6
West	17	25.8
South Central	2	3.0
	66	100.0%

The summaries in Appendix 1 are arranged by study region. Within each region, summaries are organized into two groups, those with tabulated benefits/impacts and those without such tabulations. Tabulated summaries are presented first. Within each of the two groups, summaries for the most recently completed reports appear first.

CHARACTERISTICS OF REVIEWED STUDIES

The 66 reviewed studies represent a relatively small portion of the published literature pertaining to surface coal mining, reclamation, and related topics. When classified by study region, the resulting samples are still smaller. Because of the small sample size and the lack of a random selection procedure, attempts to extrapolate the characteristics and/or findings of reviewed studies are tenuous at best. The characteristics and findings presented below apply directly to the reviewed studies; they are only suggestive of what might be found in the population at large.

A review of Exhibit 2.3 reveals that Appalachia, the West, and the National study regions contributed the greatest number of studies to the review. Since Appalachia and the West are large coal-producing areas in the country, their contributions are not surprising. The notable lack of studies for another major coal producing area, the Midwest, is less expected.

The element of chance found in all sampling procedures may be one reason for the scarcity of Midwest studies in this review. Credence for such a view is provided, for example, by our only recent awareness of the extensive reclamation research on the Midwest that has been conducted at the Coal Research Center, Southern Illinois University, Carbondale, Illinois. A sample of this work, by author and title, appears in Exhibit 2.4. Unfortunately, the existence of this group was not known in time for inclusion of any of its work in this review. Existence of the group was established during a conversation with another research group in the field, and is illustrative of the difficulties that are encountered in compiling comprehensive reviews of prior relevant studies.

It should also be noted that two of surface mining's most pressing reclamation problems, steep terrain and lack of water to support revegetation, are not found in the Midwest. Concern for these problems at the national level may tend to obscure work that has been done in the Midwest.

Exhibits 2.5 and 2.6 indicate the extent to which the reviewed studies identify and quantify specific mining and reclamation benefits and impacts. Examination of these exhibits, especially Exhibit 2.6, reveals that:

- In both the Appalachian and Western regions, over 50% of the reviewed studies address specific benefits and impacts.
- In Appalachia, 50% of the studies provide quantitative estimates for at least one of the benefits/impacts they address. Less than 12% of the West's studies contain such quantitative estimates.

EXHIBIT 2.4

ILLUSTRATIVE SAMPLE OF COAL RESEARCH RELATING TO LAND RECLAMATION CONDUCTED AT SOUTHERN ILLINOIS UNIVERSITY*

Ashby, Clark. Book: Trees for Recreation, Wildlife, and Timber on Surface Mined Lands in Illinois. Study for the Illinois Institute for Environmental Quality. Study period: 2/1/77 - 6/30/78.

Beazley, Ronald. Strip-Mined Land Reclamation Study. Study for the Illinois Institute for Environmental Quality. Study period: 1/1/75 - 6/30/75.

Butler, Brian and Braun, David. Mitigation of the Carrier Mills Archaeological District. Study for the Peabody Coal Company. Study period: 5/1/78 - 1/1/82.

Klimstra, W.D. Physical and Chemical Properties of Barren and Vegetated Spoil Materials Found on Illinois Coal Surface-Mined Lands. Study for the Illinois Institute for Environmental Quality. Study period: 5/1/75 - 10/1/75.

Klimstra, W.D. and Nawrot, J. Problem Mine Site Evaluation. Study for the Illinois Institute for Environmental Quality. Study Period: 5/1/78 - 6/30/79.

Klimstra, W.D., et al. Ecological Resources Survey on Jamestown North Area. Study for the Consolidation Coal Company. Study period: 5/4/79 - Open.

Klimstra, W.D., et al. Evaluation of Natural Revegetation of Problem Spoilbanks. Study for the Illinois Mining and Minerals Research Institute. Study period: 10/1/79 - 9/30/80.

Klimstra, W.D. and Nawrot, J. Problem Mine Site Evaluation, Supplemental Agreement No. 1. Study for the Illinois Institute of Natural Resources. Study period: 7/1/78 - 12/31/78.

Klimstra, W.D. Environmental Impact Assessment - New Delta Mine. Study for the AMAX Coal Company. Study period: 10/1/74 - 10/1/75.

Hood, William. Study of Overburden Characteristics and Mine Drainage Water. Study for the Argonne National Laboratory and Coal Extraction and Utilization Center, SIU-C. Study period: 2/13/76 - 6/30/78.

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* Citations are from a report by the Coal Extraction and Utilization Research Center, Southern Illinois University: Summary of Coal Research at Southern Illinois University, Carbondale, Illinois, 1973-1979.

EXHIBIT 2.5

NUMBERS OF STUDIES (BY REGION) THAT IDENTIFY AND QUANTIFY BENEFITS AND IMPACTS OF SURFACE COAL MINING AND RECLAMATION

Region	Number of Reports	Number of Reports With Tabulated Benefits and Impacts	Number of Reports With Quantified Benefits and Impacts	Number of Reports With Monetary Benefits and Impacts
National	12	2	1	1
Appalachia	30	18	15	7
Midwest	5	4	3	1
West	17	9	2	0
South Central	2	1	1	0
Total	66	34	22	9

EXHIBIT 2.6

PERCENTAGE OF STUDIES (BY REGION) THAT IDENTIFY AND QUANTIFY BENEFITS AND IMPACTS OF SURFACE COAL MINING AND RECLAMATION

Region	Percentage of Reports with Tabulated Benefits and Impacts	Percentage of Reports with Quantified Benefits and Impacts	Percentage of Reports with Monetary Benefits and Impacts
National	16.7%	8.3%	8.3%
Appalachia	60.0%	50.0%	23.3%
Midwest	80.0%	60.0%	20.0%
West	52.9%	11.8%	0%
South Central	50.0%	50.0%	0%

- Based on the number of studies done, and their level of quantified rigor, there is reason to suspect that research into surface coal mining and reclamation is in a more advanced state in Appalachia than in other parts of the country.

- Only about 23% of the Appalachian studies attempt to apply monetary values to their benefits and impacts; none of the Western studies make this attempt. Monetary assessments of mine-related benefits and impacts would appear, therefore, to lag behind assessments of other types (e.g. assessments of the physical environment).

- The studies conducted at the national level rarely address specific benefits and impacts in rigorous detail. Instead, they tend to address such matters in qualitative, general terms.

An examination of Appendix 1 reveals that of the 15 Appalachian studies containing quantified benefits and impacts, 14 were conducted at the local (e.g. watershed) level. In 10 of these studies, field trips provided the bulk of the input information required by the analyses. Among the analytical tools employed were:

- Laboratory analyses of various samples collected in the field

- Statistical analyses

- Economic and engineering models (mathematical and simulation)

- Experimental vs. control group, or before-after designs, for data collection and subsequent evaluation.

In 6 of the 30 Appalachian studies, matters related to benefits and impacts were discussed, but not specific benefits and impacts themselves.

Among the 5 Midwest studies, 3 contained quantified estimates; 2 of these 3 studies addressed benefits and impacts at the state level. Data for these studies appears most often to have resulted from information collected in the field. Estimation of quantified benefits and impacts involved the utilization of a before-after research design.

Quantification of benefits and impacts is found in only 2 of the 17 Western studies. In both cases, the analyses were conducted at the local (i.e. sub-state) level, and data was collected during trips to the field. Among the analytical tools employed in these studies were:

- Laboratory analyses of various types of samples collected at specific sites

- Economic models (i.e. "willingness to pay" bidding game techniques).

Two of the Western studies were concerned with matters relating to benefits and impacts, but not with specific benefits and impacts themselves.

Only 1 of the 2 South Central studies contained quantified estimates of mine-related benefits and impacts. In this study, analyses were conducted at the local level and data was collected at specific sites. Samples gathered during field trips were then subjected to laboratory analyses.

In examining the characteristics of studies containing quantified estimates of benefits and impacts, two features are notable. First, except for the Midwest, these estimates are most often generated at the sub-state level. Second, much of the needed data is collected during trips to the study sites; the data is not generally available from existing sources. Taken together, these findings suggest that:

- Needed data often does not exist and must, therefore, be generated during a benefit/impact study
- The need to develop data, and the cost of doing so, restrict the quantitative study of many mining and reclamation-related benefits to analyses at the local or site-specific level.

In fact, several of the reviewed studies state explicitly that data deficiencies are a serious impediment to quantified assessments of benefits and impacts.

FINDINGS

Given the relatively small number of reviewed studies and the site-specific nature of most of their numeric findings, no attempt will be made to to make interstudy comparisons in this discussion. Readers wishing to make such comparisons should be aware that a number of complicating factors exist. The most obvious of these factors are that:

1. Relatively few studies provide quantitative estimates of the benefits and impacts of surface coal mining and reclamation. Comparison of results is complicated by the scarcity of similarly defined, or measured, benefits and impacts. The difficulties are even more pronounced if a comparison of monetary estimates is attempted.

2. The dollars used in the studies are probably of different years; unadjusted comparisons are therefore of doubtful value. If the years associated with the various benefit/impact estimates were known, price indices could be used to adjust all the dollars to the value of a common year. Unfortunately, these years are seldom identified.

Rather than attempt a potentially ill-founded comparison of quantitative results, we have identified the areas of benefits and impacts most often addressed by the reviewed studies—both by region and for the entire sample; tabulated the frequency with which each area of concern is addressed; and made inter-regional comparisons of the resulting frequency distributions. Information required for this effort is found in the study summaries of Appendix 1. Exhibit 2.7 summarizes both the regional and overall frequency distributions.

From the information contained in Exhibit 2.7, the benefit/impact areas most frequently addressed in the reviewed studies are, in descending frequency of appearance:

- water quality
- land and its productivity
- fish, wildlife, and related habitats
- aesthetics
- erosion, sedimentation, and siltation
- flooding
- mining operations, e.g. blasting and fugitive dust
- recreation.

When water-related areas are combined into a single category, the ranking becomes:

- water
- land its productivity
- fish, wildlife, and related habitats
- aesthetics
- mining operations
- recreation.

These rankings reflect the frequency of occurrence for all studies considered in the review. Information for intra- and interregional comparisons is contained in Exhibit 2.8.

From Exhibit 2.8, it appears that, except in the Midwest, water quality is the benefit/impact area most frequently addressed. Except in Appalachia, the second most frequently addressed area relates to land and its productivity. Both findings are consistent with the overall patterns observed in Exhibit 2.7.

EXHIBIT 2.7

NUMBER OF STUDIES, BY REGION, THAT ADDRESS A SPECIFIC BENEFIT OR IMPACT OF MINING AND RECLAMATION

Region Benefit or Impact	Appalachia	Midwest	West	South Central	National	Total
Abandoned Mine Reclamation	1					1
Aesthetics	4	1	1	1	3	10
Alluvial Valley Floors			1			1
Attitudes/Perceptions of Affected Populations	1					1
Coal Production Losses*	1				1	2
Economic, Political, Social Impacts			2			2
Employment		1			2	3
Erosion, Sedimentation, Siltation	7	1		1	1	10
Fish, Wildlife, Habitats	8	1	4	1	3	17
Flood	8	1			1	10
Human Capital Costs**	2					2

* Losses resulting from reclamation regulations.

** These costs are generally associated with labor-intensive underground mining and are, therefore, presumably a benefit of more capital-intensive surface mining.

EXHIBIT 2.7 (cont.)

Region / Benefit or Impact	Appalachia	Midwest	West	South Central	National	Total
Hydrologic Change		2	3	1		6
Land and its Productivity	6	3	5	2	3	19
Mining Operations-e.g. Blasting and Fugitive Dust	2	3	2		3	10
Recreation	2		3	1	3	9
Road Damage, Coal Traffic	1					1
Water Availability			2			2
Water Quality	8	1	5	2	4	20

EXHIBIT 2.8

FIVE MOST FREQUENTLY ADDRESSED BENEFIT/ IMPACT AREAS, BY REGION

APPALACHIA

water quality
flooding
fish, wildlife, habitat
erosion, sedimentation, and siltation
land and its productivity

MIDWEST

mine operations
land and its productivity
hydrology
other areas occur with equal frequency

WEST

water quality
land and its productivity
fish, wildlife, habitat
hydrology
recreation

SOUTH CENTRAL

water quality
land and its productivity
other areas occur with equal frequency

Because surface coal mining has resulted in many water-related problems for the Appalachian region, it is not surprising that these problems constitute 3 of Appalachia's 5 most frequently addressed benefit/impact areas. Limited alternative uses may account for the lower priority that appears to have been assigned to research on land-related benefits and impacts. Much of the land being mined is so rugged that few activities other than mining and commerical forestry can be conducted on it. The same Appalachian terrain can, however, support fish and wildlife. Since both are important ecologically and for recreation and recreation-related industries, it is perhaps also not surprising that fish and wildlife constitute an active research area in the Appalachian region.

The Midwest generally has adequate water supplies and a terrain that, relative to Appalachia, is not susceptible to such water-related problems as erosion and sedimentation. This may partially account for the lower research priority that appears to be assigned in this region to the benefits and impacts of water. It should be noted, however, that the more general area of hydrology appears as an active research concern in the Midwest. Coal mining in the Midwest often affects prime farmland and the communities that this land supports. Since agriculture is an important regional activity, the high research priority that has been given to the effects of mining on agriculture is not surprising.

The high research priority assigned to water-related issues in the West is consistent with the arid conditions found in this region. Since activities such as ranching are also important, it follows that land and its productivity will be an active area of concern. Many of the West's recreational opportunities—such as national parks, hunting, and fishing—are partially dependent on fish and wildlife; it is therefore not surprising that both are also major areas of research.

Only two studies appear for the South Central Region and both involve Texas. Because the state's environmental conditions and economic activities are in many respects similar to those found in the Western study region, it is understandable that water quality and land are research concerns in both areas.

Although water-related problems are found in both Appalachia and the West, they arise from different sources. In Appalachia, water problems arise from the amount of mining that has been and is being done in the region, and from the sloping nature of its terrain; water scarcity per se is usually not a problem. This situation contrasts sharply with that in the West, where water supply is the dominant water-related concern.

The preceding discussion indicates the types of research on benefits and impacts that has been conducted to date. While valuable in assessing the general state of the research, this information is subject to the following qualifications:

- The benefit/impact areas are umbrella categories that contain several subcategories which would also have to be addressed in any detailed assessment.

- The frequency distribution of Exhibit 2.7, while directly applicable to the reviewed studies, is only indicative of the distribution that may exist within the universe of research on surface mining and reclamation.

CHAPTER III

REVIEW OF KNOWN DATA BASES AND OTHER INFORMATION SOURCES POTENTIALLY RELEVANT TO SMCRA-RELATED ASSESSMENTS

III. REVIEW OF KNOWN DATA BASES AND OTHER INFORMATION SOURCES POTENTIALLY RELEVANT TO SMCRA-RELATED ASSESSMENTS

INTRODUCTION

The purpose of this chapter is to review existing data bases and other information sources that are potentially relevant to assessments of the impacts of SMCRA. Published studies, reviewed in Chapter II, and conversations with government agencies and research organizations, described in Chapter IV, were the major means of identifying data bases and information sources. When a study, agency, or research group suggested a data base or information source as being potentially relevant, efforts were made to obtain samples of its data. In each case, the most recent versions of the data were requested. Data samples provided to the study team were then reviewed. The results of this review are presented below.

REVIEW OF DATA BASES AND INFORMATION SOURCES

Relevant data bases and information sources were classified in the following categories:

I. Agricultural Activities [illegible]

II. Land and Its Characteristics

III. Residential Activities

IV. Mine-Associated Damage to Fragile or Historic Lands

V. Injury and Property Damage from Surface Coal Mining

VI. Fish and Wildlife.

In the following pages, we discuss each of these categories in more detail.

I. Data Sources Relating to Agricultural Activities

Since surface coal mining affects both land and water resources in its areas of operation, it also affects the agricultural activities that are conducted in these areas. Among the impacts that may be exhibited are: changes in the supply of agricultural land; changes in the productivity of agricultural land; changes in the methods and/or costs of agricultural production; and changes in the prices charged by producers for their products. Data for assessing such impacts comes from a number of public and private sources. The agricultural data reviewed below is produced by federal and state government agencies.

A. State Agricultural Data Sources. Inquiries to the U.S. Department of Agriculture revealed that local (i.e. sub-state) level data for agricultural assessments would most often come from county agents and from state crop reporting boards. Since inquiries to county sources reflect a degree of specificity not appropriate to this study, inquiries for local data were directed to state agencies.

Annual agricultural statistics are prepared by the Crop Reporting Boards in the various states. Inquiries concerning this data should be directed to the Statistician-in-Charge in the state Departments of Agriculture.

For evaluating the impacts of surface coal mining on agriculture, states in Appalachia, the Midwest, and the West are of greatest interest. The Statistician-in-Charge in each of the following states was contacted concerning price and production data:

- Alabama
- Tennessee
- Ohio
- Pennsylvania
- Kentucky
- Illinois
- Indiana
- Montana
- Wyoming

In each case, a copy of the most recently published set of agricultural statistics was obtained. Data provided by Alabama was limited to production and price; data from the other states covers a wider range of agricultural topics. Because the data provided by Alabama may not be complete, it is excluded from the following discussion.

The formats and contents of Agricultural Statistics, the publication produced by each state, differ somewhat. At the county level, the following types of data were found for all states.

- Crop production, including data on acres harvested, average yield per acre, and total yield, for selected crops
- Numbers of hogs and pigs on county farms.
- Number of cattle (total and for milk) on county farms.

In addition, certain states had similar data for lambs and sheep, and for chickens.

Agricultural data available only at the state level includes:

- Prices received by farmers for selected agricultural products
- Number of farms, land in production, and average farm size
- Value per acre of agricultural land (except for Montana).

In addition, six of the nine states with complete Agricultural Statistics included indexes for prices received by farmers.

Depending on the state, time series data contained in these statistical reports ranges from 1940 (for Kentucky) through 1979. The most recent data commonly found for these states, especially at the county level, is for 1978.

The above data elements are mentioned because of their possible relevance to assessments related to SMCRA. They are, however, only a part of the information that is available from these state reports.

B. Federal Agricultural Data Sources. Agricultural data at the federal level is principally generated by two sources:

- U.S. Department of Commerce, Bureau of the Census
- U.S. Department of Agriculture

Census data is collected from the agricultural census conducted every four years; the most recent data from this source is for 1978. Data from the Department of Agriculture is published monthly and annually.

1978 Census of Agriculture. The Bureau of the Census is in the process of releasing its 1978 Census of Agriculture. Detailed statistics of potential value to SMCRA-related assessments are available at both the county and state levels. Among the relevant data elements are:

- Number of farms.
- Land under cultivation; average farm size (number of acres).

- Value of farm land.
- Distribution of farms by size.
- Land use information.
- Extent of irrigation.
- Number of farms, and farm inventories of
  - cattle and calves
  - hogs and pigs
  - sheep and lambs
  - horses and ponies
  - chickens and turkeys.

Similar data is provided for major types of crops.

These data elements are presented in identical format at the county and state levels; state reports contain additional information. Samples of state and county reports—for West Virginia and Wyoming County, West Virginia, respectively—appear in Appendix 2.

Except for price data for specific types of livestock, poultry, and crops, the 1978 agricultural census offers the most comprehensive body of county level data found during this study. The use of similar data elements and report formats enhances the value of this data for inter-county and state-county comparative analyses. Two difficulties associated with this Census data are:

- Data applies to 1978 and is, therefore, dated.
- State and county reports are still being released. No date has yet been established by which the entire Census will be available to the public.

Inquiries concerning the availability of agricultural census reports can be directed to:

Customer Services Branch
Data User Services Division
Bureau of the Census
Washington, D.C.
(301) 763-2400

U.S. Department of Agriculture. Department of Agriculture data which was surveyed in this study consists of the Department's Agricultural Statistics publication for 1979, and various reports prepared by USDA's Crop Reporting Board. Summaries of this material are presented below.

Title	Crop Reporting Board Catalog, 1979 Releases
Source	Crop Reporting Board Room 0005, South Building U.S. Department of Agriculture Washington, D.C. 20250
Description	The Crop Reporting Board prepares estimates of such data elements as agricultural production, stocks, inventories, disposition, utilization, and prices of agricultural products. This catalog lists these estimates and the dates on which they are released to the public.
Title	Crop Production
Source	Crop Reporting Board U.S. Department of Agriculture Washington, D.C. 20250 (202) 447-2127
Description	This document is issued on a monthly basis and contains production data for selected crops; the amount of data and crops covered vary from month to month. State-level data is provided for area harvested, crop yield, and/or total production, and includes information for 1979 and estimates for 1980. State data is aggregated to yield national estimates. At the beginning of each report are narrative summaries of production prospects for selected crops.
Title	Farm Production Expenditures (1978)
Source	Crop Reporting Board U.S. Department of Agriculture Room 0005, South Building Washington, D.C. 20250
Description	This document is issued on an annual basis and presents, on a national level, estimates of expenditures that the agricultural community makes for inputs to production. Expenditure data in the report examined was collected in 1979 and applies to 1978. Data is presented by the following categories: percent of surveyed farms responding; average expenditure per farm; and total expenditure. Estimated

expenditures are given both for the entire country and for farms in selected size categories (with size defined in terms of the gross value of annual sales).

Title	Agricultural Prices
Source	Crop Reporting Board U.S. Department of Agriculture Washington, D.C. 20250 (202) 447-5446
Description	This document is prepared monthly and is summarized annually. Price data is given for selected agricultural products and is broken out by state. The format and contents of the monthly reports differ slightly from month to month. For any particular commodity, national price estimates are also provided. The most recent price data from this source applies to 1980. Price data in a monthly report is specific to that month. The price data described above refers to prices received by farmers. In addition, this report includes data on parity, and prices for selected commodities (national data); an index of prices received by farmers; and price data for input factors purchased by farmers.
Title	Crop Values: Season Average Prices Received By Farmers and Value of Production
Source	Crop Reporting Board U.S. Department of Agriculture Washington, D.C. 20250
Description	This document covers a stipulated three-year period; in the January 1980 edition, this period includes 1977, 1978, and 1979. At the national level, this report contains average seasonal prices and the value of production, by year, for selected crop categories. State level crop value data is available for the second year of the reporting period and applies to crop categories. State level data pertaining to average seasonal price and value of production is available for selected crops and for each of the report's years.

Title Prospective Plantings

Source .
Crop Reporting Board
U.S. Department of Agriculture
Washington, D.C. 20250
(202) 447-2127

Description

This document is issued monthly and contains two general types of data. At the national level, data on acres of land planted and acres of land harvested is presented for selected crops. This data is given for a 10-year period, currently extending from 1971 to 1980.

State level data is presented for acres of land planted in various crops. This data is currently available for 1978 and 1979, and estimated for 1980.

In addition to its numeric data, this report contains narrative assessments of expected current year plantings of selected crops. This information is given at the national level.

Title Field Crops, Production, Disposition, Value

Source
Crop Reporting Board
U.S. Department of Agriculture
Washington, D.C. 20250

Description

The April 1980 edition of this document presents data for 1978 and 1979. This data is provided for selected crops, and furnishes information on the amount of a crop that is produced, the amount of the crop that is used on the farm, and the amount that is sold. At the national level, data is also provided on a crop's average seasonal selling price, its value of production, and its value of sales.

For certain crops, similar data is provided at the state level. State level data for other crops omits information on the volume of a crop that is consumed on the farm versus the volume that is sold.

Title Grain Stocks

Source

Crop Reporting Board
U.S. Department of Agriculture
Washington, D.C. 20250
(202) 447-4857

Description

This document is issued monthly and currently provides data for the years 1978, 1979, and 1980 (to date). This data is prepared for various grain crops and shows the quantities of each grain crop that are held in storage on farms and away from farms.

At the state level, this data appears by year for the month of the report; at the national level, it appears by month for selected months (the months selected are the month preceding the report, the report month, and the two subsequent months). In addition, grain stocks at the beginning of the report year are given by state.

Title Agricultural Statistics

Source

This publication is prepared by the Economics, Statistics, and Cooperatives Service of the U.S. Department of Agriculture. Copies may be obtained from the U.S. Government Printing Office, Washington, D.C. (stock number 001-000-04069-3).

Description

This document is an annual publication containing comprehensive agricultural statistics at both the state and national levels. This data is provided for eight commodity categories consisting of: grains; cotton, tobacco, sugar crops, and honey; oilseeds, fats, and oil; vegetables and melons; fruits, tree nuts, and horticultural specialties; hay, seeds, and minor field crops; cattle, hogs, and sheep; and dairy and poultry products. Data on farm resources, forestry activities, and other categories is also provided.

The most recent edition (1979) of this publication provides time series data, at the national level, for the period 1964 to 1978 (inclusive). Time series data at the state level covers shorter time periods; 1976 to 1978 is a period commonly used.

Among the data elements provided, those relating to the following (for selected commodities) are probably the most relevant to SMCRA-related assessments:

- production - e.g., areas harvested, yields per unit area, total producton
- average unit selling prices.

In addition, data relating to land utilization, land value, and extent of irrigation is also of potential value.

Title	Current Industrial Reports, Lumber Production and Mill Stocks 1978
Source	Industry Division Bureau of the Census U.S. Department of Commerce Washington, D.C. 20233 (301) 763-7837
Description	This document is published annually. It presents production data, expressed in board feet of lumber, for hardwoods and softwoods, and classifies this data by Census region and by states within each Census region. Data by tree species (e.g., Douglas fir and pine) is given for the Eastern and Western lumber regions. No price data appears in this document.

II. Data Sources Relating to Land and Its Characteristics

The socio-economic and environmental impacts exerted by surface coal mining and reclamation on affected land depend on various factors. These factors include topography of the land; presence of surface water; physical characteristics of the land (e.g., chemical composition); actual and potential uses to which the land may be put; plant and animal life supported by the land; and the proclivity of the land to events such as flooding and landslides. Quite clearly, for example, acid and/or toxic drainage is not a problem when the coal being mined contains little sulfur or the overburden contains few toxic substances. Similarly, the incremental impact of surface mining on the potential for landslides is greater in areas infrequently experiencing such events, than in areas where they frequently occur in any case. To gather information on these and other relevant land characteristics, the following sources were reviewed.

Title	List of Published Soil Surveys (January 1980)
Source	Soil Conservation Service (SCS) U.S. Department of Agriculture Washington, D.C.
Description	This document lists, by state, the counties for which SCS soil surveys have been conducted and published. Also shown is whether a particular soil survey is still in print. A map titled Status of Soil Surveys is also available from the Soil Conservation Service; this map indicates whether in a particular state or county: - there is a modern published soil survey; - mapping has been completed, and publication scheduled; - mapping is in progress, and publication planned; - mapping is incomplete or not started, and publication plans are incomplete. An examination of this material reveals that soil surveys are unavailable for much of eastern Kentucky, Illinois, Montana, and Wyoming; many coal-producing counties in these states currently have no published surveys.

Title	Soil Survey of District of Columbia
Source	Soil Survey Interpretations Division Soil Conservation Service U. S. Department of Agriculture P. O. Box 2890 Washington, D.C. 20013
Description	In response to an inquiry concerning the information that is contained in its soil surveys, SCS provided us with a copy of the District of Columbia Survey and indicated that the survey is representative of those done for other areas. After providing a brief description of the surveyed area, the report provides detailed information such as soil map for general planning; soil map for detailed planning; soil properties; data on planning the use and management of soils; and data on physiography, drainage, and geology. For assessing the impacts of mining and reclamation, the most relevant of this material would appear to be that on the use and management of soils, and on soil properties. Under these headings, information is provided concerning the physical and chemical properties of the surveyed soils, and their suitability for various applications. Also included is information on the water features of the area.

Title	List of Geological Survey Geologic and Water-Supply Reports and Maps for West Virginia
Source	Geological Survey U.S. Department of the Interior Washington, D.C.
Description	This document lists various reports and maps published by the Geological Survey that relate to the geology and the mineral and water resources of West Virginia. Included is a list of depositories in which much of this material may be found. The reviewed document refers specifically to West Virginia; similar documents are available for other parts of the country (e.g., a similar document has been prepared for Maryland, Delaware, and the District of Columbia). Inquiries concerning this and similar documents can be addressed to: Branch of Distribution U.S. Geological Survey 1200 South Eads Street Arlington, Virginia 22202
Title	Topographic Maps
Source	Prepared by the U.S. Geological Survey; available from the U.S. Government Printing Office, Washington, D.C. (stock number 024-001-02793-3).
Description	This pamphlet describes the various types of maps that are available from the Geological Survey and discusses the types of information that are shown in each (e.g., symbols used to identify roads and bodies of surface water). Indexes of topographic maps for areas east of the Mississippi River may be obtained by contacting: Branch of Distribution U.S. Geological Survey 1200 South Eads Street Arlington, Virginia 22202 Indexes for areas west of the Mississippi may be obtained by contacting: Branch of Distribution U.S. Geological Survey Box 25286, Federal Center Denver, Colorado 80225

These indexes, available by state, are needed when ordering specific maps.

Title	River Basins of the United States: The Wabash (USGS: INF-75-3)
Source	Geological Survey, U.S. Department of the Interior
Description	This pamphlet is one of a series that describes various characteristics of river basins in the United States. Of potential interest to SMCRA-related assessments is information pertaining to river flow, water quality, drainage area, water use, and agricultural and industrial activities conducted in the river basin.
Title	Land Use and Land Cover and Associated Maps
Source	Branch of Distribution U.S. Geological Survey 1200 South Eads Street Arlington, Virginia 22202
Description	This pamphlet describes the type of information that is available from land use maps prepared by the Geological Survey. Kinds of land use shown include urban, agricultural, rangeland, forest, and water. Strip mines are one of the specific usages shown on these maps. More information concerning this series of maps may be obtained from: Geography Program Land Information and Analysis Office U.S. Geological Survey 710 National Center Reston, Virginia (703) 860-6256

III. Data Sources Relating to Residential Activities

Potentially, the two most important direct impacts of SMCRA upon residential activity are a reduction in damages from blasting and a reduction in damages from flooding (due to siltation of rivers and streams from mining operations). The reclamation of mined land may offer an opportunity to enhance the value of land for residential applications, especially in areas where suitable land for housing is in short supply. Data pertaining to home construction activities and housing prices may reflect such an impact if, in fact, it has occurred. Information sources for housing data, and criteria for evaluating the residential utility of land, are described below.

Title	Statistical Yearbook (1977, 1978)
Source	Office of Organization and Management Information Assistant Secretary for Administration U.S. Department of Housing and Urban Development Washington, D.C.
Description	This annual statistical publication is an exhaustive compilation of housing activity data that is related to HUD operations; the most recent edition is for 1978. Much of the data is given only at the national level and probably cannot be related to mining activities. State-level data is available in such areas as: the Community Block Grant Program; the Comprehensive Planning Assistance Program; the Rehabilitation Loan Program; violations of Title VIII of the Civil Rights Act of 1968; activities of the Government National Mortgage Association; activities of the Federal Housing Administration; and low income public housing. The most relevant state-level data pertains to major disaster declarations and the National Flood Insurance Program. Since state-level data is difficult to relate to specific events, e.g., mining operations, it is of uncertain value in assessments related to SMCRA. The only local data in the publication relates to HUD's counseling program for low- and moderate-income home purchasers; this data is of little value to impact analyses related to SMCRA.

Title	Circular 4140.3 CHG (June 19, 1973)
Source	U.S. Department of Housing and Urban Development Washington, D.C. This publication is printed by the U.S. Government Printing Office (1973: 0-514-296 (362))
Description	This circular contains Data Sheet 79g, "Land Development with Controlled Earthwork," and describes HUD-FHA requirements for "any land development in which building foundations will be placed on filled ground, and/or any development in which the depth of fill below floor slabs (including basement floor or garage floor) will exceed that permitted by the Minimum Property Standards (MPS) for normal compaction methods." According to FHA, residential development on reclaimed mined land would probably be subject to these requirements. Topics covered in this circular generally relate to grading or slope control. The requirements presented in this document reflect a concerted effort to provide substantial flexibility when applying national-level guidance to site-specific projects.
Title	Federal Home Loan Bank Board News (February 28, 1980, and March 6, 1980 issues)
Source	Federal Home Loan Bank Board 1700 G Street, N.W. Washington, D.C. 20552 (202) 377-6680
Description	These documents are illustrative of the housing data that is available from the Federal Home Loan Bank Board. Most of this data is given by month and is defined at the national level. Among the more relevant types of information are: number of mortgage loans closed for the construction of housing units; number of mortgage loans closed for purchase of residential property; number of mortgage loans closed for land; interest rates charged on home mortgages; amount of loans; and average purchase price of housing (new and existing). As with other national-level data, there is no way of directly associating variations in these data elements with variations in mining operations.

Data on interest rates and purchase prices is also available for selected metropolitan areas. Since mining usually occurs in rural areas, this information is of limited value.

Title	*Housing Units Authorized by Building Permits and Public Contracts, Annual Construction Reports*, C40-78-13. (Annual for 1978 was reviewed)
Source	Construction Statistics Division U.S. Department of Commerce Washington, D.C. (This Census publication is available from the U.S. Government Printing Office, Washington, D.C.)
Description	The most recent data available in this publication applies to 1978. Data on new privately owned housing units that are authorized by permit-issuing jurisdictions is presented by the most local jurisdiction within a state; this jurisdiction is frequently defined at the county, or lower, level. Data on both public and private housing is given for selected Standard Metropolitan Statistical Areas; since these are major urban areas, their data is of limited value in analyses related to SMCRA. Similar data is given at the state level; because this data is not site-specific, it too is probably of limited value.

IV. Data Sources Relating to Mine-Associated Damage to Fragile or Historic Lands

As one of its goals, SMCRA seeks to reduce significant damage to fragile or historic lands that possess important historic, cultural, scientific, or aesthetic value. To collect data pertaining to the protection of these lands, the study team contacted:

Planning Branch
Division of State Plans and Grants
Heritage Conservation and Recreation Service
U.S. Department of the Interior
Washington, D.C.

No other potential information source for this subject area could be found.

The available material provided by the Planning Office consisted of one draft document describing a suggested approach to planning for protection of resources and one issue paper concerned with designating lands as historic. Neither paper discusses the impacts that have been experienced by such lands, or provides numeric data of any kind.

V. Data Sources Relating to Injury and Property Damage from Surface Coal Mining

Personal injuries from surface mining include: those associated with falls from unattended and/or unreclaimed highwalls; those associated with mine-related landslides; and those that are incurred in traffic accidents involving mine-related vehicles. Property damages from mining operations arise under many of the same circumstances, e.g., floods, landslides, and traffic accidents. Several data sources for assessing these impacts were reviewed for this study and are described below.

Title	American National Red Cross, Statistical and Cost Report of Disaster Operations; and American National Red Cross, Chapter Disaster Relief Report
Source	Disaster Services National Headquarters American Red Cross Washington, D.C. 20006
Description	Since emphasis in this data source is placed primarily on residential losses, mine-related losses for other types of property will not be reported. Also, the examined statistical reports contain little information that would allow direct relationships to be established between strip mining and a reported injury or case of property damage. Included in the reports is the following information: the county and state in which the disaster occurred; the date of the disaster; the number of persons dead, injured, and hospitalized; the number of dwellings destroyed, sustaining major damage, and sustaining minor damage; the number of mobile homes destroyed and sustaining major damage; the number of apartments/condominiums/etc. destroyed, sustaining major damage, and sustaining minor damage; the number of small businesses destroyed or sustaining major damage; the total number of families suffering losses; and the type of disaster (e.g., flood).
Title	Mine Accident, Injury, and Illness Report
Source	Health and Safety Analysis Center Mine Safety and Health Administration U.S. Department of Labor Denver, Colorado 80225

Description

This report form must be submitted to the Health and Safety Analysis Center by a mine operator whenever a mine-related accident, injury, or illness occurs. Communications with the Center revealed that responses from mine operators are often late and/or incomplete.

A copy of the form is contained in Appendix 3. Since it is used as input to a computerized data base, examination of the form will indicate the types of data that should be available from this source. In terms of assessments of SMCRA, the following items on the report seem most relevant: all of Section A; item L of Section B; items 4, 6, 9, 12, 18, 19, 21, and 23 of Section C; and items 28, 30, and 31 of Section D.

It should be noted that this data source was designed to assist in the operation of MSHA; the impacts estimated from its data could therefore be properly attributable to MSHA and not SMCRA. Nonetheless, an examination of this material may still provide insights into accidents that are most likely to occur around mine sites.

Title

Injury Experience in Coal Mining, 1978
(Informational Report IR 1112, 1979)

Source

Division of Mining Information Systems
Health and Safety Analysis Center
Mine Safety and Health Administration
U.S. Department of Labor
Denver, Colorado 80225

Description

Much of the mine-related injury data in this annual report is for 1978 and is defined at the national level. The data in the report is classified by: type of surface mining operation (e.g., strip, auger); severity of injury; cause of accident; mine size; occupational category of the injured worker; and the state in which the accident occurred. Potentially relevant data elements include: number of lost work days; average severity of reported injuries; and incident rates for reported injuries. All of this data is available at the state level.

Because this data is specific to MSHA's activities, it may not be appropriate for use in assessments related to SMCRA.

Title

Fatal Accidents Reporting System (1979):

- Accident Level
- Vehicle-Driver Level
- Person Level

Source

National Center for Statistics and Analysis
National Highway Traffic Safety Administration (NHTSA)
U.S. Department of Transportation
Washington, D.C. 20590

Description

This material consists of three input forms for the Fatal Accident Reporting System data base maintained by NHTSA. While much of the published material appears at the national level, it would be possible to access the data base to the county, and perhaps the sub-county, level. The data elements of special relevance to assessments related to SMCRA include: city, county, and state in which an accident occurs; class of traffic way (e.g., inter-state, county road); road alignment (i.e., straight, curved); grade (i.e., level, grade); surface type (e.g., concrete, blacktop); land use (i.e., urban, rural); number of vehicles involved; number of persons involved; and accident severity. A copy of these forms appears in Appendix 4.

In assessing the usefulness of this data base to evaluations of SMCRA, two factors should be kept in mind: the only accidents reported are fatal accidents on public roads; and no information exists in the data base to associate an accident explicitly with mine operations.

VI. Data Sources Relating to Fish and Wildlife

Through its potential for such water-related impacts as acid and toxic chemical pollution, sedimentation, and siltation, surface coal mining significantly affects both surface waters and the aquatic communities that live in these waters. By clearing away ground cover, surface mining disrupts or destroys breeding grounds and/or food sources for resident wildlife. Since fish and wildlife have recreational and ecological values, examination of changes in these values is pertinent to economic assessments of surface mining, reclamation, and other topics related to SMCRA.

No data bases were found for wildlife; whatever data was available was found in the wildlife studies reviewed for this report. (Summaries of these wildlife studies are contained in Appendix 1.) Data relating to fish was obtained from both federal and state data sources; these sources are described below.

Title	Statistical Digest No. 69, Fishery Statistics of the United States, 1975.
Source	Produced by the National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce; available from the U.S. Government Printing Office, Washington, D.C. (Stock Number 003-020-00146-7).
Description	Only commercial fishing activities are included in this report; fish caught for sport or personal use are not considered. The types of data included are: volume and value of landed catches; employment of labor in fishing activities; quantity of fishing gear operated; number of fishing craft; volume and value of production of processed fishery products; freezing/cold storage holdings; and foreign trade in fisheries commodities. Most relevant to SMCRA is data that relates to the volume and value of fishing activity and to the quantities of resources that are employed in these activities. Data for all 50 states appears on p. 16 of this document; state-specific data in the document's other sections applies only to states actively involved in commercial fishing. For this reason, this document would seem useful for making assessments for only a limited number of coal-producing states (e.g., Illinois and Kentucky) that also support a fishing industry.

Title	Current Fishery Statistics No. 8000, Fisheries of the United States, 1979.
Source	Resource Statistics Division National Marine Fisheries Service National Oceanic and Atmospheric Administration U.S. Department of Commerce Washington, D.C. (202) 634-7366
Description	Though the bulk of its data is devoted to commercial activities, this document also reports on recreational fishing. Data relevant to SMCRA includes: volume and value of fish landings; wholesale and retail prices for fishery products; employment of labor in fishing activity; and quantities of equipment devoted to such activity. Data on wholesale and retail prices, and on vessels employed, is given at the national level only; employment of labor data, and data pertaining to the volume and value of commerical fishing, is available at the state level.
Title	Monetary Values of Fish (1975)
Source	This publication is a revision of Monetary Value of Fish (1970) prepared by the Pollution Committee, Southern Division, American Fisheries Society. It is printed by the Tennessee Wildlife Resources Agency, P.O. Box 40747, Nashville, Tennessee.
Description	This document contains data on the values of various species of fish, and is expressed in 1974 dollars. As defined here, value is the average purchase price of each fish at the hatchery; transportation costs and expenses incurred in restocking procedures are not included. The geographical scope of this data is the Southeast portion of the United States. The purpose of this material is to assess the cost of replacing fish species depleted by pollution.

FINDINGS

The impacts of surface coal mining and subsequent land reclamation are often site-specific. Assessment of these impacts will frequently require the use of local level data; data defined at the state and national levels will usually have limited application. Furthermore, in order to assess SMCRA and its regulations, data pertaining to both pre- and post-Act operating environments will be required. Taken together, these points suggest that much of the required data must, for analytical purposes, be defined for geographical regions no larger than counties, and that it should be available through 1979--and preferably into 1980.

An examination of agricultural data sources reveals that county-level data is available from state Crop Reporting Boards and the Bureau of the Census; data from the U.S. Department of Agriculture is only defined at the state and national levels. Of the two sources of county level data, the Census Bureau is more exhaustive in its coverage of agricultural operations. The most recent available agricultural data at the county level applies, however, to 1978; only state and national data is more recent (both of the latter are current).

Data on land and its characteristics is available at both the county and sub-county levels. Detailed county Soil Survey reports are available from the Soil Conservation Service of the U.S. Department of Agriculture. Supplementary data pertaining to topography, land use, and proclivity of the land to flooding and landslides is available in the form of maps prepared by the U.S. Geological Survey. Although this material is often a number of years old, the slowly changing character of most rural land lessens the impact of using older information.

For evaluating the impact of land reclamation on housing construction, the Bureau of the Census is the most relevant source. The Census maintains data on building permits issued, and this data is defined at the local level. However, 1978 is the most recent year for which this data could be obtained. Data sources other than the Census were no more recent, had data elements defined only at the state or national levels, and/or had data elements not relevant to assessments related to SMCRA.

The impact of surface mining on fragile or historic lands is an area of specific concern to SMCRA. Although the Heritage Conservation and Recreation Service, U.S. Department of the Interior, is becoming involved in this area, neither it nor another source could be found with relevant data.

The most relevant source of data for injuries caused by mining is the American Red Cross. This data is current and is defined at the county or sub-county level. Missing from the Red Cross data base, however, is a data element that would allow direct relationships to be drawn between a reported injury and a specific mining activity. Traffic fatalities potentially caused by mine-related vehicles and occurring on public roads are reported by the National Highway Traffic Safety Administration; like the Red Cross data, this data is defined at the local level but cannot be related directly to mining activities. The Mine Safety and Health Administration, U.S. Department of Labor, maintains accident data that is specific to that agency's mission; whether this data is appropriate to analyses related to SMCRA remains unclear.

Data for assessing the impact of mining on fish and wildlife is fragmentary. No data bases were found for wildlife; whatever data was available appeared in the studies which are reviewed in Chapter II. Data for fish applies specifically to landings of commerical fish species; the most recent of this data is for 1979 and describes the volumes of different species that were landed, by state. Information on the monetary value of fish is provided by other sources—and dates from 1975.

Based on this review, it seems clear that any attempt to assess mine-related impacts using existing data will be confronted with significant data deficiencies. This finding is consistent with the extensive efforts to develop data that are discussed by many of the studies reviewed in this report. These efforts involved the creation of site-specific data bases, and entailed extensive work at the sites being studied.

APPENDIX 2

Examples of 1978 Census of Agriculture Reports:

- State Report: West Virginia
- County Report: Wyoming County, West Virginia

1978 CENSUS OF AGRICULTURE
PRELIMINARY REPORT
WEST VIRGINIA

AC78-P-54-000

Issued April 1980

The preliminary reports are being published on a flow basis for all counties in the United States with 10 farms or more and for each State, geographic region, and the United States. This series is intended to provide, at the earliest date, information on major data items. These items are standard for each State and county except in Table 3, Crops Harvested, where the items will vary by State according to their relative importance in the State in 1978. The 1978 data are subject to revision. Final data will be published in Volume 1, State and County Data.

Inventories of livestock and poultry and other specified items are as of December 31 of the census year. Crop and livestock production and sales data are for calendar year 1978, except for a few crops (such as citrus) for which the production year overlaps the calendar year. The volume 1 appendix will provide a more detailed description of how the census was taken along with pertinent definitions and explanations.

The 1978 census data collection program was the first to include an area segment sample to provide reliable estimates, for States, of the number and the characteristics of any farms not represented in the mail portion of the census. Estimates for such farms are an integral part of the totals shown in the State reports, but are not included in county totals, thus State totals for 1978 and 1974 are not directly comparable. The contribution of the area segment sample to State totals is shown on pages 5 through 8.

In keeping with prior practice, the dollar figures shown in this report have not been adjusted for changes in price levels between census years.

Definition of farm—In accordance with a joint agreement between the U.S. Department of Agriculture, the Office of Management and Budget, and the Bureau of the Census, announced on August 12, 1975, a farm, for statistical purposes, is any place from which $1,000 or more of agricultural products were sold, or normally would have been sold, during the census year. The previous definition (used for the 1959, 1964, 1969 censuses, and for the 1974 preliminary county reports) counted as a farm any place with less than 10 acres from which $250 or more of agricultural products were sold or normally would have been sold during the census year, or any place of 10 acres or more from which $50 or more of agricultural products were sold or normally would have been sold during the census year.

The effect of the change in definition on 1978 and 1974 data is shown for selected items in the appendix on page 4.

Sampling—Data collected from only a sample of farms are subject to sampling error. The appendix in volume 1 will contain a detailed discussion.

Special tribute is paid to the millions of farm and ranch operators and other agriculture-associated people who furnished the individual reports from which these statistical summaries were compiled. Also acknowledged with gratitude is the contributory effort of U.S. Department of Agriculture and other county-level government and private officials who offered their support and willingly assisted individuals requesting help in completing their 1978 census reports.

The following symbols are used throughout the tables:
- Zero. (D) Data withheld to avoid disclosing information for individual farms.
(X) Not applicable. (Z) Less than half of the unit reported. (NA) Not available.

Table 1. Selected Summary Items: 1978 and 1974

	All farms		Farms with sales of $2,500 or more	
	1978	1974	1978	1974
Farms and land in farms:				
Farms ... number	20 619	16 909	9 580	6 099
Land in farms ... acres	3 583 641	3 496 606	2 564 085	2 067 066
Average size of farm ... acres	174	207	268	339
Value of land and buildings: [1]				
Average per farm ... dollars	112 777	62 094	156 167	102 284
Average per acre ... dollars	592	300	578	302
Farms by size:				
Less than 10 acres ... number	832	454	272	154
10 to 49 acres ... number	3 210	2 190	742	288
50 to 179 acres ... number	9 837	8 280	3 874	2 006
180 to 499 acres ... number	5 376	4 724	3 494	2 514
500 to 999 acres ... number	1 067	972	905	821
1,000 to 1,999 acres ... number	246	279	233	259
2,000 acres or more ... number	61	60	50	57
Land according to use:				
Total cropland ... farms	19 904	16 344	9 219	5 873
acres	1 517 956	1 329 192	996 828	739 049
Harvested cropland ... farms	18 641	14 889	8 810	5 626
acres	606 479	511 182	439 361	345 554
Cropland used only for pasture ... farms	12 336	10 965	5 663	3 497
acres	815 577	738 918	505 900	359 146
Other cropland ... farms	3 320	2 602	1 450	971
acres	95 900	79 092	51 567	34 349
Woodland including woodland pastured ... farms	15 755	12 735	7 511	4 665
acres	1 563 392	1 346 696	967 347	787 757
Other pastureland and rangeland ... farms	8 172	12 589	3 414	2 874
acres	627 835	820 718	491 285	454 597
Land in house lots, ponds, roads, wasteland, etc. ... farms	13 841	(*)	6 383	4 138
acres	174 458	(*)	108 625	85 653
Irrigated land ... farms	154	113	103	56
acres	1 699	1 513	1 202	1 139

See footnotes at end of table.

U.S. Department of Commerce
Bureau of the Census

For sale by Subscribers Services Section (Publications), Bureau of the Census, Washington D.C. 20233 or any Department of Commerce district office
Price 25 cents per copy

Table 1. Selected Summary Items: 1978 and 1974 —Con.

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Agricultural products sold and farm related income:					
Market value of products sold [3]	$1,000	200 299	133 088	186 742	120 801
Average per farm	dollars	9 714	7 871	19 493	19 774
Crops	$1,000	46 994	34 473	43 979	31 025
Livestock and livestock products	$1,000	118 459	71 869	108 057	62 904
Poultry and poultry products	$1,000	34 848	25 189	34 706	25 036
Farms by value of sales:					
Sales of $20,000 or more	number	1 523	1 254	1 511	1 238
$100,000 or more	number	356	213	350	210
$40,000 to $99,999	number	510	474	506	463
$20,000 to $39,999	number	657	567	655	565
Sales of less than $20,000	number	19 096	15 655	8 069	4 861
$10,000 to $19,999	number	1 245	881	1 241	879
$5,000 to $9,999	number	2 654	1 555	2 650	1 552
$2,500 to $4,999	number	4 181	2 432	4 178	2 430
Less than $2,500	number	11 016	10 787	(X)	(X)
Value of agricultural products sold directly to individuals for human consumption	farms	1 812	(NA)	782	(NA)
	$1,000	2 225	(NA)	1 808	(NA)
Income from machine work, customwork, and other agricultural services provided for others	farms	115	1 000	703	494
	$1,000	961	1 119	758	813
Farms by type of organization:					
Individual or family	number	19 084	(NA)	8 644	5 580
Partnership	number	1 295	(NA)	777	422
Corporation	number	142	(NA)	133	82
Family held	number	127	(NA)	118	(NA)
Other than family held	number	15	(NA)	15	(NA)
Other—cooperatives, estates or trusts, institutional, etc	number	98	(NA)	28	15
Operator characteristics:					
Tenure of operator:					
Full owner	farms	15 818	13 842	8 584	4 147
Part owner	farms	3 682	2 611	2 472	1 619
Tenant	farms	1 121	658	524	333
Principal occupation and residence: [4]					
Farming	farms	7 712	7 496	4 488	3 78
Residence on farm operated	farms	6 290	(NA)	3 631	(NA
Residence not on farm operated	farms	820	(NA)	393	(NA
Other than farming	farms	12 907	9 292	5 114	2 22
Residence on farm operated	farms	9 349	(NA)	3 569	(NA
Residence not on farm operated	farms	2 154	(NA)	1 033	(NA
Average age of operator [4]	years	53.0	54.3	52.9	53.1
Sex of operator	male	19 061	(NA)	8 878	(NA
	female	1 558	(NA)	702	(NA
Operators reporting days of work off farm: [4]					
Any	farms	13 258	9 799	5 879	2 81
100 days or more	farms	11 616	8 313	4 990	2 29
Selected production expenses: [1]					
Livestock and poultry purchased	$1,000	24 886	17 102	23 008	14 58
Feed purchased for livestock and poultry	$1,000	41 790	34 431	38 465	30 78
Commercially mixed formula feeds	$1,000	30 819	27 810	29 738	25 96
Animal health costs	$1,000	1 986	(NA)	1 644	[illegible]
Seeds, bulbs, plants, and trees	$1,000	3 608	2 120	3 308	1 9
Commercial fertilizer	$1,000	9 508	6 694	8 100	5 9
Other agricultural chemicals including lime	$1,000	4 770	2 400	4 220	2 1
Hired farm labor	$1,000	16 837	11 136	15 263	9 9
Workers working 150 days or more	farms	1 170	(NA)	1 053	[illegible]
	number	2 483	(NA)	2 267	2 0
Contract labor	$1,000	2 153	1 049	2 098	9
Customwork and machine hire	$1,000	2 006	1 347	1 543	1 0
Energy costs - petroleum products, electricity, coal, wood, coke, etc	$1,000	14 216	(NA)	11 479	(N
Gasoline and other petroleum products	$1,000	11 079	7 105	8 894	5 2
Gasoline	$1,000	8 567	(NA)	5 073	3 3
Diesel fuel	$1,000	2 015	(NA)	1 730	[illegible]
Machinery and equipment: [1]					
Estimated market value of all machinery and equipment	$1,000	259 382	180 806	178 603	98
Average per farm	dollars	12 605	11 211	18 500	[illegible]
Motortrucks including pickups	farms	15 804	12 776	7 842	4
	number	21 967	16 858	12 467	[illegible]
Wheel tractors	farms	17 871	13 578	8 670	5
	number	28 021	22 112	16 361	[illegible]

[1] 1978 data are based on a sample of farms.
[2] Data included with Other pastureland and rangeland.
[3] 1974 data include sales of forest products.
[4] 1974 data exclude corporations and other organizations.

Table 2. Livestock and Poultry: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Cattle and calves inventory	farms	16 252	14 161	7 909	5 304
	number	457 344	495 460	353 365	336 359
Farms by size of inventory:					
1 to 19	farms	9 635	6 742	2 615	892
	number	92 621	68 817	29 783	10 267
20 to 99	farms	5 882	6 531	4 577	3 535
	number	226 705	265 490	189 019	167 724
100 to 499	farms	716	870	699	861
	number	124 439	146 541	(D)	144 918
500 or more	farms	19	18	18	16
	number	13 579	14 612	(D)	(D)
Cows and heifers that had calved	farms	14 604	12 307	7 220	4 882
	number	242 662	257 014	186 812	174 372
Beef cows	farms	13 310	10 841	6 575	4 183
	number	205 375	214 782	152 956	137 811
Milk cows	farms	3 711	4 433	2 001	2 023
	number	37 287	42 232	33 856	36 561
Heifers and heifer calves	farms	11 761	(NA)	6 033	3 946
	number	106 552	(NA)	81 763	76 044
Steers and bulls including calves	farms	13 236	(NA)	6 795	4 379
	number	108 130	(NA)	84 790	85 943
Cattle and calves sold	farms	15 156	12 878	8 731	5 347
	number	252 620	199 846	214 [illegible]	149 386
Cattle fattened on grain and concentrates	farms	1 583	(NA)	997	585
	number	18 447	(NA)	16 321	12 806
Dairy products sold	farms	903	(NA)	810	962
	$1,000	35 209	(NA)	34 581	27 546
Hogs and pigs inventory	farms	3 335	3 225	1 674	1 361
	number	55 061	47 866	45 744	37 209
Farms by size of inventory:					
1 to 99	farms	3 234	3 124	1 576	1 266
	number	30 010	28 603	21 380	18 923
100 to 499	farms	92	97	89	91
	number	16 815	15 725	16 128	14 748
500 or more	farms	9	4	9	4
	number	8 236	3 538	8 236	3 538
Hogs and pigs used or to be used for breeding	farms	1 441	(NA)	927	782
	number	7 643	(NA)	6 407	5 017
Hogs and pigs sold	farms	1 843	1 736	1 212	1 049
	number	77 027	67 861	66 369	58 169
Feeder pigs sold	farms	676	672	460	392
	number	23 457	22 680	19 976	18 383
Litters farrowed between—					
Dec. 1 of preceding year and Nov. 30	farms	1 584	1 417	967	840
	number	9 647	8 628	8 153	6 963
Dec. 1 of preceding year and May 31	farms	1 236	1 068	847	692
	number	4 977	4 322	4 225	3 444
June 1 and Nov. 30	farms	1 130	1 084	735	682
	number	4 670	4 306	3 928	3 519
Sheep and lambs inventory	farms	2 384	2 687	1 475	1 293
	number	111 892	135 483	88 466	91 020
Ewes 1 year old or older	farms	2 207	(NA)	1 426	1 270
	number	77 251	(NA)	61 126	61 813
Sheep and lambs sold	farms	2 303	2 653	1 489	1 314
	number	86 208	109 538	74 174	76 329
Sheep and lambs shorn	farms	2 236	(NA)	1 452	1 263
	number	85 147	(NA)	68 259	68 918
	pounds of wool	490 937	(NA)	396 199	401 321
Horses and ponies inventory	farms	5 463	4 445	2 312	1 295
	number	18 026	13 363	6 622	5 487
Chickens 3 months old or older inventory	farms	4 638	4 077	1 799	1 299
	number	632 020	696 046	555 810	612 170
Hens and pullets of laying age inventory	farms	4 532	3 924	1 789	1 273
	number	542 627	616 713	474 394	542 983
Farms by size of inventory:					
1 to 1,599	farms	4 480	3 870	1 718	1 220
	number	139 036	145 948	(D)	75 516
1,600 to 9,999	farms	40	41	39	40
	number	187 241	159 902	(D)	(D)
10,000 or more	farms	12	13	12	13
	number	216 350	(D)	216 350	(D)
Broilers sold	farms	149	187	128	151
	number	14 255 463	14 907 028	14 254 254	14 905 820
Turkeys sold	farms	107	(NA)	81	78
	number	2 874 658	(NA)	2 874 338	1 550 602

Table 3. Crops Harvested: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Corn for grain or seed	farms	4 232	4 245	2 551	2 148
	acres	65 259	54 867	58 452	47 312
	bu	5 875 875	3 903 463	5 408 506	3 485 713
Corn for silage or green chop (green)	farms	1 932	(NA)	1 709	1 901
	acres	37 510	(NA)	35 735	33 420
	tons	603 574	(NA)	580 049	491 332
Wheat for grain	farms	523	905	412	651
	acres	5 412	9 779	4 890	8 580
	bu	179 867	323 573	167 010	289 689
Oats for grain	farms	984	(NA)	704	686
	acres	7 925	(NA)	6 767	6 434
	bu	340 663	(NA)	296 655	327 121
Barley for grain	farms	248	(NA)	218	376
	acres	3 568	(NA)	3 381	5 689
	bu	159 006	(NA)	152 638	288 136
Tobacco	farms	1 344	1 166	622	381
	acres	1 549	1 227	1 025	689
	lbs	2 435 838	1 985 331	1 671 922	1 188 121
Irish potatoes	farms	1 482	1 881	632	580
	acres	1 034	1 477	611	965
	cwt	132 222	182 625	86 579	119 484
Hay, all (dry)	farms	16 816	13 065	8 081	5 005
	acres	465 736	372 000	310 903	222 173
	tons	769 674	652 606	580 587	442 271
Alfalfa hay (dry)	farms	3 931	(NA)	2 484	1 589
	acres	79 780	(NA)	61 486	41 007
	tons	179 324	(NA)	150 986	100 917
Other tame dry hay (dry)	farms	12 354	(NA)	6 034	(NA)
	acres	317 040	(NA)	207 900	182 879
	tons	487 582	(NA)	366 617	311 052
Land in orchards	farms	1 117	833	466	289
	acres	23 546	21 233	21 690	20 318
Apples	farms	996	(NA)	428	267
	acres	19 158	(NA)	17 974	18 511
	lbs	287 719 458	(NA)	286 046 002	139 029 819
Vegetables, sweet corn or melons for sale	farms	422	488	217	158
	acres	1 540	(NA)	1 234	1 811

Appendix. Effect of Definition Change for Selected Items: 1978 and 1974

		Definition used for 1974 and 1978		Definition used for 1959, 1964, and 1969		Operations excluded by current definition but not by 1959 definition	
		1978	1974	1978	1974	1978	1974
All farms	number	20 619	16 909	30 403	19 103	9 784	2 194
Farms with sales less than $2,500	number	11 016	10 787	20 800	12 981	9 784	2 194
Land in farms	acres[1]	3 883 641	3 496 606	4 428 918	3 641 069	545 277	144 463
Total cropland	acres	1 517 956	1 329 192	1 686 518	1 356 827	168 562	27 635
Harvested cropland	acres	606 479	511 182	641 877	515 706	35 398	4 524
Value of agricultural products sold	$1,000	200 299	133 088	202 120	133 525	1 821	437
Crops	$1,000	46 994	34 473	47 586	34 666	592	193
Livestock, poultry, and their products	$1,000	153 305	96 858	154 534	97 096	1 229	238
Cattle and calves inventory	number	457 344	495 480	470 204	498 286	12 860	2 806
Hogs and pigs inventory	number	55 061	47 866	56 625	48 163	1 564	297
Chickens 3 months old or older inventory	number	632 020	696 046	689 772	703 708	57 752	7 662

ESTIMATED NUMBER AND CHARACTERISTICS OF FARMS NOT INCLUDED IN COUNTY TOTALS

The 1978 Census of Agriculture was conducted primarily by mail for maximum economy, supplemented by thorough personal canvass of a statistical area segment sample for maximum accuracy of coverage.

The following portion of the State preliminary report is based on the area segment sample, and provides estimates of the number and characteristics of any farms in the State not represented in the mail portion of the 1978 census. The sample design provided for reliable estimates for States but was not large enough to provide estimates for counties. Thus, any data item for 1978 in the State totals portion of this preliminary report (pages 1-4) can normally be expected to be the sum of that data item as reported in the county preliminary reports plus the entry for that data item in this "not allocated to counties" portion.

Data collection for the 1969 and 1974 Censuses of Agriculture was primarily by mail. The mailing lists for these censuses were compiled from the previous census and from records obtained from the Internal Revenue Service, U.S. Department of Agriculture, other government agencies, and nongovernment agriculture-related associations.

The constant change occurring in farm operations and the time involved in obtaining source lists and combining them into a final mailing list cause the list to be somewhat out of date before it is used. In addition, some farm operators, particularly for small operations, never appear on any of the source lists. Evaluation studies for both the 1969 and 1974 censuses indicated that the lists were not adequate to assure complete coverage. The estimates indicate that approximately 17 percent of all farms were missed in the 1969 census and 13 percent were missed in the 1974 census, representing about 3 percent of the total value of all agricultural products sold for each of the two census years.

Although the aggregate value of products attributable to the farms which were missed was small both in terms of total products and farms reporting various types of products, the undercoverage was significant especially in number of farms. The dual system of data collection was implemented for the 1978 census in order to minimize the effect of undercoverage on census data. In addition to complete coverage of a mailing list, enumerators canvassed an area segment sample in each State and interviewed farm operators for census data. This sample was designed to provide State estimates for farms not on the mailing list. Data for all farms on the mailing list were used to prepare county reports. Farms enumerated in the area segments but not identified on the mailing list were used as the basis for estimating the total number and characteristics of all farms in the State not on the mailing list.

For 1974, data were collected only from the mailing list and the State total for a specific item is equal to the sum of the county reports. No data comparable to the 1978 area segment sample estimates were included in 1974 State totals. The State totals for 1978 with the area segment sample data—not allocated to counties—excluded, are directly comparable to the 1974 State totals. An evaluation of coverage for the 1978 census will be provided in a special coverage report.

Since the data in this report were collected from a sample of farms, all items are subject to sampling error. The appendix in volume 1 will contain a detailed discussion and measures of sampling error for census data.

The following symbols are used throughout the tables:
- Zero. (D) Data withheld to avoid disclosing information for individual farms.
(X) Not applicable. (Z) Less than half of the unit reported. (NA) Not available.

Table 1. Selected Summary Items: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Farms and land in farms:					
Farms	number..	3 129	(NA)	684	(NA)
Land in farms	acres..	345 141	(NA)	98 166	(NA)
Average size of farm	acres..	110	(NA)	144	(NA)
Value of land and buildings: [1]					
Average per farm	dollars..	75 244	(NA)	94 792	(NA)
Average per acre	dollars..	682	(NA)	660	(NA)
Farms by size:					
Less than 10 acres	number..	319	(NA)	44	(NA)
10 to 49 acres	number..	895	(NA)	134	(NA)
50 to 179 acres	number..	1 414	(NA)	353	(NA)
180 to 499 acres	number..	436	(NA)	114	(NA)
500 to 999 acres	number..	65	(NA)	39	(NA)
1,000 to 1,999 acres	number..	-	(NA)	-	(NA)
2,000 acres or more	number..	-	(NA)	-	(NA)
Land according to use:					
Total cropland	farms..	3 010	(NA)	671	(NA)
	acres..	159 971	(NA)	47 356	(NA)
Harvested cropland	farms..	2 737	(NA)	623	(NA)
	acres..	43 991	(NA)	15 167	(NA)
Cropland used only for pasture	farms..	1 964	(NA)	383	(NA)
	acres..	101 061	(NA)	27 840	(NA)
Other cropland	farms..	552	(NA)	154	(NA)
	acres..	14 919	(NA)	4 349	(NA)
Woodland including woodland pastured	farms..	2 055	(NA)	483	(NA)
	acres..	145 378	(NA)	37 199	(NA)
Other pastureland and rangeland	farms..	686	(NA)	172	(NA)
	acres..	26 676	(NA)	9 257	(NA)
Land in house lots, ponds, roads, wasteland, etc	farms..	2 232	(*)	513	(NA)
	acres..	13 116	(*)	4 354	(NA)
Irrigated land	farms..	25	(NA)	25	(NA)
	acres..	25	(NA)	25	(NA)

[1] See footnotes at end of table.

Table 1. Selected Summary Items: 1978 and 1974 —Con.

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Agricultural products sold and farm related income:					
Market value of products sold [3]	$1,000	6 288	(NA)	4 222	(NA)
Average per farm	dollars	2 009	(NA)	6 173	(NA)
Crops	$1,000	1 640	(NA)	1 149	(NA)
Livestock and livestock products	$1,000	4 231	(NA)	2 681	(NA)
Poultry and poultry products	$1,000	417	(NA)	383	(NA)
Farms by value of sales:					
Sales of $20,000 or more	number	26	(NA)	26	(NA)
$100,000 or more	number	-	(NA)	-	(NA)
$40,000 to $99,999	number	9	(NA)	9	(NA)
$20,000 to $39,999	number	17	(NA)	17	(NA)
Sales of less than $20,000	number	3 103	(NA)	658	(NA)
$10,000 to $19,999	number	30	(NA)	30	(NA)
$5,000 to $9,999	number	206	(NA)	206	(NA)
$2,500 to $4,999	number	422	(NA)	422	(NA)
Less than $2,500	number	2 445	(NA)	(X)	(X)
Value of agricultural products sold directly to individuals for human consumption	farms	240	(NA)	40	(NA)
	$1,000	66	(NA)	2	(NA)
Income from machine work, customwork, and other agricultural services provided for others	farms	139	(NA)	63	(NA)
	$1,000	35	(NA)	26	(NA)
Farms by type of organization:					
Individual or family	number	3 031	(NA)	661	(NA)
Partnership	number	73	(NA)	23	(NA)
Corporation	number	-	(NA)	-	(NA)
Family held	number	-	(NA)	-	(NA)
Other than family held	number	-	(NA)	-	(NA)
Other—cooperatives, estates or trusts, institutional, etc	number	25	(NA)	-	(NA)
Operator characteristics:					
Tenure of operator:					
Full owner	farms	2 392	(NA)	513	(NA)
Part owner	farms	351	(NA)	86	(NA)
Tenant	farms	386	(NA)	85	(NA)
Principal occupation and residence: [4]					
Farming	farms	1 121	(NA)	266	(NA)
Residence on farm operated	farms	1 066	(NA)	253	(NA)
Residence not on farm operated	farms	20	(NA)	-	(NA)
Other than farming	farms	2 008	(NA)	418	(NA)
Residence on farm operated	farms	1 846	(NA)	338	(NA)
Residence not on farm operated	farms	162	(NA)	80	(NA)
Average age of operator [4]	years	51.8	(NA)	49.1	(NA)
Sex of operator	male	2 823	(NA)	542	(NA)
	female	306	(NA)	142	(NA)
Operators reporting days of work off farm: [4]					
Any	farms	1 978	(NA)	484	(NA)
100 days or more	farms	1 879	(NA)	433	(NA)
Selected production expenses: [1]					
Livestock and poultry purchased	$1,000	856	(NA)	378	(NA)
Feed purchased for livestock and poultry	$1,000	1 518	(NA)	908	(NA)
Commercially mixed formula feeds	$1,000	1 081	(NA)	796	(NA)
Animal health costs	$1,000	105	(NA)	38	(NA)
Seeds, bulbs, plants, and trees	$1,000	154	(NA)	111	(NA)
Commercial fertilizer	$1,000	259	(NA)	126	(NA)
Other agricultural chemicals including lime	$1,000	177	(NA)	84	(NA)
Hired farm labor	$1,000	189	(NA)	120	(NA)
Workers working 150 days or more	farms	27	(NA)	15	(NA)
	number	27	(NA)	15	(NA)
Contract labor	$1,000	10	(NA)	8	(NA)
Customwork and machine hire	$1,000	49	(NA)	20	(NA)
Energy costs - petroleum products, electricity, coal, wood, coke, etc	$1,000	699	(NA)	272	(NA)
Gasoline and other petroleum products	$1,000	580	(NA)	227	(NA)
Gasoline	$1,000	396	(NA)	137	(NA)
Diesel fuel	$1,000	69	(NA)	48	(NA)
Machinery and equipment: [1]					
Estimated market value of all machinery and equipment	$1,000	20 384	(NA)	5 668	(NA)
Average per farm	dollars	6 527	(NA)	8 267	(NA)
Motortrucks including pickups	farms	2 268	(NA)	456	(NA)
	number	2 583	(NA)	575	(NA)
Wheel tractors	farms	2 672	(NA)	596	(NA)
	number	3 117	(NA)	815	(NA)

[1] 1978 data are based on a sample of farms.
[2] Data included with Other pastureland and rangeland.
[3] 1974 data include sales of forest products.
[4] 1974 data exclude corporations and other organizations.

Table 2. Livestock and Poultry: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Cattle and calves inventory	farms	2 307	(NA)	435	(NA)
	number	28 274	(NA)	7 899	(NA)
Farms by size of inventory:					
1 to 19	farms	1 896	(NA)	275	(NA)
	number	15 737	(NA)	2 637	(NA)
20 to 99	farms	411	(NA)	160	(NA)
	number	12 537	(NA)	5 262	(NA)
100 to 499	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)
500 or more	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)
Cows and heifers that had calved	farms	1 806	(NA)	332	(NA)
	number	15 250	(NA)	4 646	(NA)
Beef cows	farms	1 615	(NA)	310	(NA)
	number	14 110	(NA)	4 111	(NA)
Milk cows	farms	444	(NA)	70	(NA)
	number	1 140	(NA)	535	(NA)
Heifers and heifer calves	farms	1 303	(NA)	268	(NA)
	number	7 043	(NA)	1 968	(NA)
Steers and bulls including calves	farms	1 606	(NA)	314	(NA)
	number	5 981	(NA)	1 285	(NA)
Cattle and calves sold	farms	1 943	(NA)	506	(NA)
	number	14 623	(NA)	7 216	(NA)
Cattle fattened on grain and concentrates	farms	112	(NA)	70	(NA)
	number	435	(NA)	244	(NA)
Dairy products sold	farms	30	(NA)	30	(NA)
	$1,000	613	(NA)	613	(NA)
Hogs and pigs inventory	farms	690	(NA)	193	(NA)
	number	3 080	(NA)	1 103	(NA)
Farms by size of inventory:					
1 to 99	farms	690	(NA)	193	(NA)
	number	3 080	(NA)	1 103	(NA)
100 to 499	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)
500 or more	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)
Hogs and pigs used or to be used for breeding	farms	229	(NA)	94	(NA)
	number	407	(NA)	187	(NA)
Hogs and pigs sold	farms	290	(NA)	68	(NA)
	number	3 120	(NA)	1 357	(NA)
Feeder pigs sold	farms	105	(NA)	56	(NA)
	number	1 391	(NA)	1 021	(NA)
Litters farrowed between—					
Dec. 1 of preceding year and Nov. 30	farms	292	(NA)	107	(NA)
	number	582	(NA)	273	(NA)
Dec. 1 of preceding year and May 31	farms	170	(NA)	82	(NA)
	number	290	(NA)	142	(NA)
June 1 and Nov. 30	farms	196	(NA)	59	(NA)
	number	292	(NA)	131	(NA)
Sheep and lambs inventory	farms	253	(NA)	80	(NA)
	number	4 534	(NA)	2 315	(NA)
Ewes 1 year old or older	farms	158	(NA)	80	(NA)
	number	3 378	(NA)	2 024	(NA)
Sheep and lambs sold	farms	158	(NA)	80	(NA)
	number	2 703	(NA)	1 652	(NA)
Sheep and lambs shorn	farms	158	(NA)	80	(NA)
	number	3 669	(NA)	2 030	(NA)
	pounds of wool	18 255	(NA)	10 654	(NA)
Horses and ponies inventory	farms	1 220	(NA)	274	(NA)
	number	3 647	(NA)	1 223	(NA)
Chickens 3 months old or older inventory	farms	1 085	(NA)	199	(NA)
	number	97 485	(NA)	76 424	(NA)
Hens and pullets of laying age inventory	farms	1 046	(NA)	195	(NA)
	number	93 653	(NA)	75 822	(NA)
Farms by size of inventory:					
1 to 1,599	farms	1 033	(NA)	182	(NA)
	number	28 653	(NA)	10 822	(NA)
1,600 to 9,999	farms	13	(NA)	13	(NA)
	number	65 000	(NA)	65 000	(NA)
10,000 or more	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)
Broilers sold	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)
Turkeys sold	farms	-	(NA)	-	(NA)
	number	-	(NA)	-	(NA)

Table 3. Crops Harvested: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Corn for grain or seed	farms	603	(NA)	153	(NA)
	acres	3 015	(NA)	1 579	(NA)
	bu	203 504	(NA)	127 440	(NA)
Corn for silage or green chop (green)	farms	59	(NA)	35	(NA)
	acres	653	(NA)	621	(NA)
	tons	9 977	(NA)	9 417	(NA)
Wheat for grain	farms	21	(NA)	13	(NA)
	acres	47	(NA)	39	(NA)
	bu	1 344	(NA)	1 248	(NA)
Oats for grain	farms	82	(NA)	48	(NA)
	acres	820	(NA)	505	(NA)
	bu	20 515	(NA)	19 075	(NA)
Barley for grain	farms	-	(NA)	-	(NA)
	acres	-	(NA)	-	(NA)
	bu	-	(NA)	-	(NA)
Tobacco	farms	197	(NA)	73	(NA)
	acres	196	(NA)	111	(NA)
	lbs	356 432	(NA)	208 500	(NA)
Irish potatoes	farms	202	(NA)	16	(NA)
	acres	60	(NA)	7	(NA)
	cwt	8 259	(NA)	792	(NA)
Hay, all (dry)	farms	2 322	(NA)	542	(NA)
	acres	38 473	(NA)	11 970	(NA)
	tons	53 226	(NA)	20 850	(NA)
Alfalfa hay (dry)	farms	191	(NA)	104	(NA)
	acres	2 054	(NA)	1 361	(NA)
	tons	4 100	(NA)	2 831	(NA)
Other tame dry hay (dry)	farms	1 956	(NA)	438	(NA)
	acres	33 520	(NA)	9 809	(NA)
	tons	43 988	(NA)	16 793	(NA)
Land in orchards	farms	201	(NA)	47	(NA)
	acres	404	(NA)	60	(NA)
Apples	farms	180	(NA)	47	(NA)
	acres	260	(NA)	29	(NA)
	lbs	65 010	(NA)	18 330	(NA)
Vegetables, sweet corn or melons for sale	farms	79	(NA)	33	(NA)
	acres	118	(NA)	67	(NA)

Appendix. Effect of Definition Change for Selected Items: 1978 and 1974

		Definition used for 1974 and 1978		Definition used for 1959, 1964, and 1969		Operations excluded by current definition but not by 1959 definition	
		1978	1974	1978	1974	1978	1974
All farms	number	3 129	(NA)	8 174	(NA)	5 045	(NA)
Farms with sales less than $2,500	number	2 445	(NA)	7 490	(NA)	5 045	(NA)
Land in farms	acres	345 141	(NA)	560 543	(NA)	215 402	(NA)
Total cropland	acres	159 971	(NA)	237 594	(NA)	77 623	(NA)
Harvested cropland	acres	43 991	(NA)	58 061	(NA)	14 070	(NA)
Value of agricultural products sold	$1,000	6 288	(NA)	7 099	(NA)	811	(NA)
Crops	$1,000	1 640	(NA)	1 836	(NA)	197	(NA)
Livestock, poultry, and their products	$1,000	4 648	(NA)	5 262	(NA)	614	(NA)
Cattle and calves inventory	number	28 274	(NA)	34 643	(NA)	6 369	(NA)
Hogs and pigs inventory	number	3 080	(NA)	4 047	(NA)	987	(NA)
Chickens 3 months old or older inventory	number	97 485	(NA)	135 666	(NA)	38 181	(NA)

1978 CENSUS OF AGRICULTURE
PRELIMINARY REPORT
WYOMING COUNTY, W. VA.

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Issued April 1980

The preliminary reports are being published on a flow basis for all counties in the United States with 10 farms or more and for each State, geographic region, and the United States. This series is intended to provide, at the earliest date, information on major data items. These items are standard for each State and county except in Table 3, Crops Harvested, where the items will vary by State according to their relative importance in the State in 1978. The 1978 data are subject to revision. Final data will be published in Volume 1, State and County Data.

Inventories of livestock and poultry and other specified items are as of December 31 of the census year. Crop and livestock production and sales data are for calendar year 1978, except for a few crops (such as citrus) for which the production year overlaps the calendar year. The volume 1 appendix will provide a more detailed description of how the census was taken along with pertinent definitions and explanations.

In the county reports, data for farms reporting, acreages, and inventories for 1978 and 1974 are directly comparable. In keeping with prior practice, the dollar figures shown in this report have not been adjusted for changes in price levels between census years.

The 1978 census data collection program included an area segment sample to provide reliable estimates, for States, of the number and the characteristics of any farms not represented in the mail portion of the census. The preliminary report for each State will include tables to show the part of each State total representing farms not found on the mailing list and not included in county totals.

Definition of farm—In accordance with a joint agreement between the U.S. Department of Agriculture, the Office of Management and Budget, and the Bureau of the Census, announced on August 12, 1975, a farm, for statistical purposes, is any place from which $1,000 or more of agricultural products were sold, or normally would have been sold, during the census year. The previous definition (used for the 1959, 1964, 1969 censuses, and for the 1974 preliminary county reports) counted as a farm any place with less than 10 acres from which $250 or more of agricultural products were sold or normally would have been sold during the census year, or any place of 10 acres or more from which $50 or more of agricultural products were sold or normally would have been sold during the census year.

The effect of the change in definition on 1978 and 1974 data is shown for selected items in the appendix on page 4.

Sampling—Data collected from only a sample of farms are subject to sampling error. The appendix in volume 1 will contain a detailed discussion.

Special tribute is paid to the millions of farm and ranch operators and other agriculture-associated people who furnished the individual reports from which these statistical summaries were compiled. Also acknowledged with gratitude is the contributory effort of U.S. Department of Agriculture and other county-level government and private officials who offered their support and willingly assisted individuals requesting help in completing their 1978 census reports.

The following symbols are used throughout the tables:
- Zero. (D) Data withheld to avoid disclosing information for individual farms.
(X) Not applicable. (Z) Less than half of the unit reported. (NA) Not available.

Table 1. Selected Summary Items: 1978 and 1974

	All farms		Farms with sales of $2,500 or more	
	1978	1974	1978	1974
Farms and land in farms:				
Farms ....number..	40	43	11	3
Land in farms ....acres..	3 834	4 233	2 283	69
Average size of farm ....acres..	96	98	208	23
Value of land and buildings: [1]				
Average per farm ....dollars..	91 424	44 442	121 253	68 000
Average per acre ....dollars..	954	451	584	2 970
Farms by size:				
Less than 10 acres ....number..	5	2	1	2
10 to 49 acres ....number..	11	11	2	-
50 to 179 acres ....number..	20	24	4	1
180 to 499 acres ....number..	3	5	3	-
500 to 999 acres ....number..	1	1	1	-
1,000 to 1,999 acres ....number..	-	-	-	-
2,000 acres or more ....number..	-	-	-	-
Land according to use:				
Total cropland ....farms..	38	40	10	3
acres..	1 798	1 743	1 113	37
Harvested cropland ....farms..	34	33	10	3
acres..	503	382	300	29
Cropland used only for pasture ....farms..	26	35	9	1
acres..	1 235	1 300	(D)	(D)
Other cropland ....farms..	4	8	1	-
acres..	60	61	(D)	-
Woodland including woodland pastured ....farms..	26	27	6	-
acres..	1 774	1 778	1 061	-
Other pastureland and rangeland ....farms..	4	29	1	-
acres..	94	712	(D)	-
Land in house lots, ponds, roads, wasteland, etc. ....farms..	18	(¹)	5	2
acres..	168	(¹)	(D)	(D)
Irrigated land ....farms..	-	1	-	-
acres..	-	(D)	-	-

See footnotes at end of table.

U.S. Department of Commerce
Bureau of the Census

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Price 25 cents per copy

Table 1. Selected Summary Items: 1978 and 1974 —Con.

	All farms		Farms with sales of $2.500 or more	
	1978	1974	1978	1974
Agricultural products sold and farm related income:				
Market value of products sold [3] .... $1,000..	78,	89	52	50
Average per farm .... dollars..	1 952	1 806	4 687	16 667
Crops .... $1,000..	18	(D)	11	(D)
Livestock and livestock products .... $1,000..	(D)	19	(D)	3
Poultry and poultry products .... $1,000..	(D)	(Z)	(D)	-
Farms by value of sales:				
Sales of $20,000 or more .... number..	-	2	-	2
$100,000 or more .... number..	-	-	-	-
$40,000 to $99,999 .... number..	-	-	-	-
$20,000 to $39,999 .... number..	-	2	-	2
Sales of less than $20,000 .... number..	40	41	11	1
$10,000 to $19,999 .... number..	-	-	-	-
$5,000 to $9,999 .... number..	4	-	4	-
$2,500 to $4,999 .... number..	7	1	7	1
Less than $2,500 .... number..	29	40	(X)	(X)
Value of agricultural products sold directly to individuals for human consumption .... farms..	4	(NA)	1	(NA)
$1,000..	3	(NA)	(D)	(NA)
Income from machine work, customwork, and other agricultural services provided for others .... farms..	1	1	1	-
$1,000..	(D)	(Z)	(D)	-
Farms by type of organization:				
Individual or family .... number..	40	(NA)	11	3
Partnership .... number..	-	(NA)	-	-
Corporation .... number..	-	(NA)	-	-
Family held .... number..	-	(NA)	-	(NA)
Other than family held .... number..	-	(NA)	-	(NA)
Other—cooperatives, estates or trusts, institutional, etc .... number..	-	(NA)	-	-
Operator characteristics:				
Tenure of operator:				
Full owner .... farms..	32	32	7	3
Part owner .... farms..	4	9	2	-
Tenant .... farms..	4	2	2	-
Principal occupation and residence: [4]				
Farming .... farms..	8	10	4	2
Residence on farm operated .... farms..	5	(NA)	3	(NA)
Residence not on farm operated .... farms..	1	(NA)	1	(NA)
Other than farming .... farms..	32	33	7	1
Residence on farm operated .... farms..	19	(NA)	6	(NA)
Residence not on farm operated .... farms..	8	(NA)	1	(NA)
Average age of operator [4] .... years..	55.4	56.6	51.5	58.3
Sex of operator .... male..	37	(NA)	10	(NA)
female..	3	(NA)	1	(NA)
Operators reporting days of work off farm: [4]				
Any .... farms..	28	29	9	1
100 days or more .... farms..	25	27	7	1
Selected production expenses: [1]				
Livestock and poultry purchased .... $1,000..	8	11	(D)	(Z)
Feed purchased for livestock and poultry .... $1,000..	12	14	4	(D)
Commercially mixed formula feeds .... $1,000..	1	8	(D)	(Z)
Animal health costs .... $1,000..	-	(NA)	-	-
Seeds, bulbs, plants, and trees .... $1,000..	1	2	-	(Z)
Commercial fertilizer .... $1,000..	4	4	1	(Z)
Other agricultural chemicals including lime .... $1,000..	2	1	1	-
Hired farm labor .... $1,000..	2	3	(D)	(D)
Workers working 150 days or more .... farms..	-	(NA)	-	-
number..	-	(NA)	-	-
Contract labor .... $1,000..	(D)	(D)	(D)	-
Customwork and machine hire .... $1,000..	(D)	(Z)	(D)	(Z)
Energy costs - petroleum products, electricity, coal, wood, coke, etc .... $1,000..	10	(NA)	5	(NA)
Gasoline and other petroleum products .... $1,000..	8	8	4	3
Gasoline .... $1,000..	6	(NA)	3	1
Diesel fuel .... $1,000..	1	(NA)	(D)	-
Machinery and equipment: [1]				
Estimated market value of all machinery and equipment .... $1,000..	374	326	188	27
Average per farm .... dollars..	9 350	7 581	17 100	9 000
Motortrucks including pickups .... farms..	27	35	10	3
number..	31	40	11	5
Wheel tractors .... farms..	31	33	10	-
number..	34	44	11	-

[1] 1978 data are based on a sample of farms.
[2] Data included with Other pastureland and rangeland.
[3] 1974 data include sales of forest products.
[4] 1974 data exclude corporations and other organizations.

Table 2. Livestock and Poultry: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Cattle and calves inventory	farms	30	39	8	1
	number	436	511	208	(D)
Farms by size of inventory:					
1 to 19	farms	23	31	3	1
	number	210	222	(D)	(D)
20 to 99	farms	7	8	5	-
	number	228	289	(D)	-
100 to 499	farms	-	-	-	-
	number	-	-	-	-
500 or more	farms	-	-	-	-
	number	-	-	-	-
Cows and heifers that had calved	farms	29	28	8	1
	number	231	282	117	(D)
Beef cows	farms	24	21	7	1
	number	215	262	113	(D)
Milk cows	farms	11	14	3	1
	number	16	20	4	(D)
Heifers and heifer calves	farms	24	(NA)	6	-
	number	87	(NA)	49	-
Steers and bulls including calves	farms	26	(NA)	6	-
	number	108	(NA)	42	-
Cattle and calves sold	farms	23	24	9	1
	number	229	122	157	(D)
Cattle fattened on grain and concentrates	farms	5	(NA)	2	-
	number	21	(NA)	(D)	-
Dairy products sold	farms	-	(NA)	-	-
	$1,000	-	(NA)	-	-
Hogs and pigs inventory	farms	9	14	1	1
	number	31	42	(D)	(D)
Farms by size of inventory:					
1 to 99	farms	9	14	1	1
	number	31	42	(D)	(D)
100 to 499	farms	-	-	-	-
	number	-	-	-	-
500 or more	farms	-	-	-	-
	number	-	-	-	-
Hogs and pigs used or to be used for breeding	farms	3	(NA)	-	1
	number	8	(NA)	-	(D)
Hogs and pigs sold	farms	5	1	2	1
	number	32	(D)	(D)	(D)
Feeder pigs sold	farms	-	1	-	1
	number	-	(D)	-	(D)
Litters farrowed between—					
Dec. 1 of preceding year and Nov. 30	farms	3	3	-	1
	number	5	6	-	(D)
Dec. 1 of preceding year and May 31	farms	2	2	-	-
	number	(D)	(D)	-	-
June 1 and Nov. 30	farms	2	1	-	1
	number	(D)	(D)	-	(D)
Sheep and lambs inventory	farms	3	4	1	-
	number	43	71	(D)	-
Ewes 1 year old or older	farms	3	(NA)	1	-
	number	36	(NA)	(D)	-
Sheep and lambs sold	farms	2	4	1	-
	number	(D)	66	(D)	-
Sheep and lambs shorn	farms	3	(NA)	1	-
	number	27	(NA)	(D)	-
	pounds of wool	161	(NA)	(D)	-
Horses and ponies inventory	farms	13	20	1	1
	number	25	40	(D)	(D)
Chickens 3 months old or older inventory	farms	12	15	2	-
	number	685	588	(D)	-
Hens and pullets of laying age inventory	farms	12	14	2	-
	number	585	571	(D)	-
Farms by size of inventory:					
1 to 1,599	farms	12	14	2	-
	number	585	571	(D)	-
1,600 to 9,999	farms	-	-	-	-
	number	-	-	-	-
10,000 or more	farms	-	-	-	-
	number	-	-	-	-
Broilers sold	farms	-	-	-	-
	number	-	-	-	-
Turkeys sold	farms	1	(NA)	-	-
	number	(D)	(NA)	-	-

Table 3. Crops Harvested: 1978 and 1974

		All farms		Farms with sales of $2,500 or more	
		1978	1974	1978	1974
Corn for grain or seed	farms	8	8	4	1
	acres	23	18	14	(D)
	bu.	1 488	367	1 040	(D)
Corn for silage or green chop (green)	farms	-	(NA)	-	-
	acres	-	(NA)	-	-
	tons	-	(NA)	-	-
Wheat for grain	farms	-	-	-	-
	acres	-	-	-	-
	bu.	-	-	-	-
Oats for grain	farms	-	(NA)	-	-
	acres	-	(NA)	-	-
	bu.	-	(NA)	-	-
Barley for grain	farms	-	(NA)	-	-
	acres	-	(NA)	-	-
	bu.	-	(NA)	-	-
Tobacco	farms	-	-	-	-
	acres	-	-	-	-
	lbs.	-	-	-	-
Irish potatoes	farms	5	7	1	1
	acres	3	3	(D)	(D)
	cwt.	107	84	(D)	(D)
Hay, all (dry)	farms	26	28	9	1
	acres	455	339	284	(D)
	tons	451	427	301	(D)
Alfalfa hay (dry)	farms	3	(NA)	-	-
	acres	28	(NA)	-	-
	tons	43	(NA)	-	-
Other tame dry hay (dry)	farms	24	(NA)	9	(NA)
	acres	412	(NA)	283	(NA)
	tons	394	(NA)	300	(NA)
Land in orchards	farms	8	2	-	-
	acres	15	(D)	-	-
Apples	farms	7	(NA)	-	(NA)
	acres	14	(NA)	-	(NA)
	lbs.	3 575	(NA)	-	(NA)
Vegetables, sweet corn or melons for sale	farms	6	7	-	-
	acres	11	(NA)	-	-

Appendix. Effect of Definition Change for Selected Items: 1978 and 1974

		Definition used for 1974 and 1978		Definition used for 1959, 1964, and 1969		Operations excluded by current definition but not by 1959 definition	
		1978	1974	1978	1974	1978	1974
All farms	number	40	43	72	62	32	19
Farms with sales less than $2,500	number	29	40	61	59	32	19
Land in farms	acres	3 834	4 233	6 048	4 783	2 214	550
Total cropland	acres	1 798	1 743	2 360	1 973	562	230
Harvested cropland	acres	503	382	652	405	149	23
Value of agricultural products sold	$1,000	78	69	83	72	5	3
Crops	$1,000	18	(D)	20	(D)	2	2
Livestock, poultry, and their products	$1,000	61	19	63	20	3	1
Cattle and calves inventory	number	436	511	478	527	42	16
Hogs and pigs inventory	number	31	42	38	50	7	8
Chickens 3 months old or older inventory	number	665	598	865	683	200	85

APPENDIX 3

MSHA Mine Accident Report Form

MINE ACCIDENT, INJURY, AND ILLNESS REPORT

SECTION A—IDENTIFICATION DATA

Report category: Metal/nonmetal mining ☐ Coal mining ☐

Check here if this report pertains to a lessee or contractor ☐

MSHA ID Number__________ Mine name __________

Company name__________

SECTION B—COMPLETE FOR EACH ACCIDENT IMMEDIATELY REPORTED TO MSHA

1. Accident code (circle applicable code—see instructions) 01 —Death 02 —Serious injury 03—Entrapment 04—Inundation 05 —Gas or dust ignition 06 —Mine fire 07 —Explosives 08 —Roof fall 09 —Outburst 10 —Impounding dam 11 —Hoisting. 12 —Off site injury
2. Name of investigator __________ 3. Date investigation started (mo)____(da)____(yr)______
4. Steps taken to prevent recurrence of accident __________

SECTION C—COMPLETE FOR EACH REPORTABLE ACCIDENT, INJURY, OR ILLNESS

Accident information

5. Circle the codes which best describe where the accident occurred (see instructions).

(a.) Surface location

02 Surface at underground mine
30 Mill, preparation plant, etc.
03 Strip/open pit mine
04 Surface auger operation
05 Culm bank/refuse pile
06 Dredge mining
12 Other surface mining
17 Independent shops (with own MSHA ID)
99 Office facilities

(b.) Underground location

01 Vertical shaft
02 Slope/inclined shaft
03 Face
04 Intersection
05 Underground shop/office
06 Other

(c.) Underground mining method

01 Longwall
02 Shortwall
03 Conventional/stoping
05 Continuous miner
06 Hand
07 Caving
98 Other

6. Date of accident (mo)____ (da)____(yr) ______ 7. Time of accident______ ☐ a.m. ☐ p.m. 8. Time shift started______ ☐ a.m. ☐ p.m.
9. Describe fully the conditions contributing to the accident and quantify the damage or impairment__________
10. Equipment involved: Type__________
Manufacturer__________ Model number __________
11. Name of witness to accident__________

Injury and illness information

12. Number of reportable injuries or illnesses resulting from this accident__________
13. Name of injured/ill employee __________ 14. Sex ______
15. Date of birth (mo)____(da)____(yr)______ 16. Last 4 digits of social security number______
17. Regular job title__________ 18. Check if this injury/illness resulted in death ☐
19. Check box if injury / illness resulted in permanent disability ☐ (include amputation, loss of use, and permanent total disability)
20. What directly inflicted injury or illness__________
21. Nature of injury or illness__________ 22. Part of body injured or affected ______
23. Occupational illness (circle applicable code—see instructions) 21—Occupational skin diseases 22—Dust diseases of the lungs 23—Respiratory conditions (toxic agents) 24—Poisoning (toxic materials) 25—Disorders (physical agents) 26—Disorders (repeated trauma) 29—Other
24. Employee's work activity when injury or illness occurred __________
25. Experience in this job title (yrs)______ (wks)______
26. Experience at this mine (yrs)______ (wks)______
27. Total mining experience (yrs)______ (wks)______

FOR OFFICIAL USE ONLY

Degree______
Accident type______
Accident class______
Scheduled charge______

SECTION D—RETURN TO DUTY INFORMATION

28. Permanently transferred or terminated ☐ (If checked, complete items 29, 30, and 31)
29. Date returned to regular job at full capacity (or item 28 above) (mo)______(da)______(yr)______
30. Number of days away from work ______ 31. Number of days restricted work activity______
(Items 30 and 31 must be answered when case is closed: if none enter 0)

Person completing form: (name)__________

Date this report prepared (mo)______(da)______ (yr)______(area code and phone number)______

PAGE 1 MAIL THIS PAGE TO THE HEALTH AND SAFETY ANALYSIS CENTER, MINE SAFETY AND HEALTH ADMINISTRATION, P.O. BOX 25367, FEDERAL CENTER, DENVER, CO 80225

APPENDIX 4

NHTSA/DOT Traffic Accident Report Form

STATE CASE NO. ____________

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Form Approved
O.M.B. No. 004R-5634

FATAL ACCIDENT REPORTING SYSTEM (1979) —ACCIDENT LEVEL—

This report is authorized by The Highway Safety Act of 1966, P.L. 89-564. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate and timely.

CASE NUMBER STATE (GSA CODES) 1 2 ☐☐

CONSECUTIVE NUMBER 3–6 ☐☐☐☐

TRANSACTION CODE 7 8 ☐☐
11—Original Submission
12—Update or Change
1

CARD NO. 9: 1

CITY 14–17 ☐☐☐☐

COUNTY 18–20 ☐☐☐

DATE (MONTH DAY YEAR) 21–26 ☐☐☐☐ 7 9

TIME 27–30 ☐☐☐☐
Military Time
9999—Unknown

VEHICLES 31 32 ☐☐
No. of Vehicle Forms Submitted

PERSONS 33 34 ☐☐
No. of Person Forms Submitted

VEHICLES INVOLVED 35 36 ☐☐
No. of Vehicles in Accident

LAND USE 37 ☐
1—Urban
2—Rural
9—Unknown

CLASS TRAFFICWAY 38 ☐
1—Interstate
2—Other Limited Access
3—Other U.S. Route
4—Other State Route
5—Other Major Artery
6—County Road
7—Local Street
8—Other Road
9—Unknown

TA-1 CLASS 39 ☐
1—Interstate
2—Other Federal Aid Primary
3—Federal Aid Secondary
4—Federal Aid Urban Arterials
5—Federal Aid Urban Collectors
6—Non-Federal Aid Arterials
7—Non-Federal Aid Collectors
8—Non-Federal Aid Local
9—Unknown

SPECIAL JURISDICTION 40 ☐
0—Not Applicable
1—National Park Service
2—Military
3—Indian Reservation
4—College/University Campus
5—Other Federal Properties
8—Other
9—Unknown

FIRST HARMFUL EVENT 41 42 ☐☐

NON-COLLISION
01—Overturn
02—Fire/Explosion
03—Immersion
04—Gas Inhalation
05—Fell from Vehicle
06—Injured in Vehicle
07—Other Non-Collision

COLLISION WITH
08—Pedestrian
09—Pedalcycle
10—Railway Train
11—Animal
12—Motor Vehicle in Transport
13—Motor Vehicle in Other Roadway
14—Parked Motor Vehicle
15—Other Type Non-Occupant
16—Other Object (Not Fixed)

COLLISION WITH FIXED OBJECT
18—Buildings
19—Culvert/Ditch
20—Curb or Wall
21—Divider
22—Embankment
23—Fence
24—Guard Rail
25—Light Support
26—Sign Post
27—Tree/Shrubbery
28—Utility Pole
29—Other Poles/Support
30—Impact Attenuator
31—Other Fixed Object
32—Bridge or Overpass (Passing Under)
33—Bridge or Overpass (Passing Over)
99—Unknown

MANNER OF COLLISION 43 ☐
0—Not Applicable (First Harmful Event not equal to 12 or 13)
1—Rear-End
2—Head-On
3—Rear-to-Rear
4—Angle
5—Sideswipe, same Direction
6—Sideswipe, opposite Direction
9—Unknown

RELATION TO JUNCTION 44 ☐
1—Non-Junction
2—Intersection
3—Intersection Related
4—Interchange Area
5—Driveway, Alley Access, etc.
6—Entrance/Exit Ramp
7—Rail Grade Crossing
9—Unknown

RELATION TO ROADWAY 45 ☐
1—On Roadway
2—Shoulder
3—Median
4—Roadside
5—Outside Right-of-Way
6—Off Roadway—Location Unknown
9—Unknown

ROADWAY FLOW 46 ☐
1—Divided Highway, Median Strip
2—Divided Highway, Guardrail
3—Divided Highway, Other Barrier or Barrier Type Unknown
4—Not Physically Divided
5—One Way Trafficway
9—Unknown

NUMBER OF LANES (ROADWAY) 47 ☐
Actual Value Except:
6—Six or More Lanes
9—Unknown

SPEED LIMIT 48 49 ☐☐
ACTUAL MILES PER HOUR EXCEPT:
99—Unknown

ALIGNMENT 50 ☐
1—Straight
2—Curve
9—Unknown

GRADE 51 ☐
1—Level
2—Grade
9—Unknown

PAVEMENT SURFACE TYPE 52 ☐
1—Concrete
2—Blacktop
3—Brick or Block
4—Slag, Gravel or Stone
5—Dirt
8—Other
9—Unknown

SURFACE CONDITION 53 ☐
0—Dry
1—Wet
2—Snow
3—Ice
4—Sand, Dirt, Oil
8—Other
9—Unknown

TRAFFIC CONTROLS 54 55 ☐☐
00—No Controls
01—Flashing Traffic Signal
02—On Colors Traffic Signal
03—Stop Sign
04—Yield Sign
05—Physically Controlling RR Crossing
06—Stop Sign for RR Crossing
07—Other RR Crossing
08—School Zone Sign
09—Traffic Controls Not Functioning
10—Pedestrian Signal
98—Other
99—Unknown

LIGHT CONDITION 56 ☐
1—Daylight
2—Dark
3—Dark but lighted
4—Dawn or Dusk
9—Unknown

WEATHER/ATMOSPHERE 57 ☐
0—Clear
1—Rain
2—Sleet
3—Snow
4—Fog, Smog, Smoke, Blowing Sand or Dust
5—Cloudy
8—Other
9—Unknown

HIT AND RUN 58 ☐
0—Not Applicable
1—Hit Motor Vehicle
2—Hit Non-Occupant
3—Left Scene

TYPE EMERGENCY MEDICAL SERVICE 59 ☐
0—None
1—Commercial or Private Unit
2—Municipal or Volunteer Unit
3—Hospital Based Unit
4—State or Fed Unit
5—Type Unknown
6—Two or More Types
8—Other
9—Unknown

NOTIFICATION TIME EMS 60–63 ☐☐☐☐
Military Time Except:
0000—Not Applicable
9999—Unknown

ARRIVAL TIME EMS 64–67 ☐☐☐☐
Military Time Except:
0000—Not Applicable
9999—Unknown

SCHOOL BUS RELATED 68 ☐
0—No
1—Yes

RELATED FACTORS 69 70 ☐☐ 71 72 ☐☐ 73 74 ☐☐
See Instruction Manual "Related Factors—ACCIDENT LEVEL"

RAIL GRADE CROSSING IDENTIFIER 75–81 ☐☐☐☐☐☐☐
(See Instruction Manual)

Card No. 9: 2

ADDITIONAL STATE INFORMATION 14–33 ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
(See Instruction Manual)

HS Form 214 (Rev. 10/78)

STATE CASE NO. ____________

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Form Approved
OMB No. 004R-5634

FATAL ACCIDENT REPORTING SYSTEM (1979) —VEHICLE-DRIVER LEVEL—

This report is authorized by The Highway Safety Act of 1966, P.L. 89-564. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate and timely.

CASE NUMBER STATE (GSA CODES) 1 2

CONSECUTIVE NUMBER 3 6

TRANSACTION CODE 7 8 — 2
21—Original Submission
22—Update or Change

CARD NO. 9 — 1

VEHICLE NUMBER (Assigned by Analyst) 10 11

VEHICLE MAKE (See Instruction Manual) 14 15

VEHICLE MODEL (See Instruction Manual) 16 17

BODY TYPE (See Instruction Manual) 18 19

MODEL YEAR 20 21
Actual Value except
99—Unknown

VEHICLE IDENTIFICATION NO. 22 36
Actual Value except:
Zero Fill if not applicable
Nine Fill if Unknown

REGISTRATION STATE 37 38
GSA CODES Except:
00—No Registration Not Applicable
93—Multiple State Reg., In State
94—Multiple State Reg., Out-of-State
95—U.S. Government Tags
96—Military Vehicle
97—Foreign Countries
99—Unknown

ROLLOVER 39
0—No Rollover
1—First Event
2—Subsequent Event

INSPECTION CERTIFICATE 40
0—Not Applicable
1—No Inspection Certificate
2—Current
3—Expired
9—Unknown

TRAVEL SPEED 41 42
Actual Miles Per Hour Except:
00—Stopped Vehicle
95—Ninety-Five MPH or Greater
99—Unknown

TOWED VEHICLE 43
0—Not Applicable
1—Travel-Trailer/Camper
2—Other Car Trailer
8—Other
9—Unknown

SPECIAL USE 44
0—Not Applicable
1—Taxi
2—Vehicle Used as School Bus
3—Vehicle Used as Other Bus
4—Military
5—Police
9—Unknown

EMERGENCY USE 45
0—No
1—Yes

IMPACT POINT—INITIAL 46 47
00—Non-Collision
01-12—Clock Points
13—Top
14—Undercarriage
99—Unknown

IMPACT POINT—PRINCIPAL 48 49
00—Non-Collision
01-12—Clock Points
13—Top
14—Undercarriage
15—Under Ride
99—Unknown

EXTENT OF DEFORMATION 50
0—None
2—Other (Minor)
4—Functional (Moderate)
6—Disabling (Severe)
9—Unknown

IMPACTS 51
0—Non-Collision
1—Striking
2—Struck
3—Both
9—Unknown

TOWAWAY 52
0—Not Applicable
1—Towed Away
2—Abandoned
9—Unknown

FIRE/EXPLOSION 53
0—Not Applicable
1—Fire/Explosion Occurred in Vehicle During Accident

NUMBER OF OCCUPANTS 54 55
Actual Value if Total Known
97—Unknown—Only Injured Reported
99—Unknown

RELATED FACTORS 56 57 58 59
See Instruction Manual "Related Factors—Vehicle Level"

MOST HARMFUL EVENT 60 61

NON-COLLISION
01—Overturn
02—Fire/Explosion
03—Immersion
04—Gas Inhalation
05—Fell from Vehicle
06—Injured in Vehicle
07—Other Non-Collision

COLLISION WITH
08—Pedestrian
09—Pedalcycle
10—Railway Train
11—Animal
12—Motor Vehicle in Transport
13—Motor Vehicle in Other Roadway
14—Parked Motor Vehicle
15—Other Type Non-Occupant
16—Other Object (Not Fixed)

COLLISION WITH FIXED OBJECT
18—Building
19—Culvert/Ditch
20—Curb or Wall
21—Divider
22—Embankment
23—Fence
24—Guard Rail
25—Light Support
26—Sign Post
27—Tree/Shrubbery
28—Utility Pole
29—Other Poles/Support
30—Impact Attenuator
31—Other Fixed Object
32—Bridge or Overpass (Passing Under)
33—Bridge or Overpass (Passing Over)
99—Unknown

Card No. 9 — 2

DRIVER PRESENCE 14
1—Driver Operated Vehicle
2—No Driver
3—Driver Left Scene
9—Unknown

LICENSE STATE GSA CODES 15 16
Except:
94—Military
95—Canada
96—Mexico
97—Other Foreign Countries
99—Unknown

LICENSE STATUS 17
0—No License Required
1—No License, License Required
2—Licensed, but not for this type of vehicle
3—Valid License for this type of vehicle
4—Suspended License
5—Revoked License
6—Expired License
7—Learner's Permit
9—Unknown

COMPLIANCE WITH LICENSE RESTRICTIONS 18
0—No Restrictions or Not Applicable
1—Restrictions Complied With
2—Restrictions Not Complied With
3—Restrictions, Compliance Unknown
9—Unknown

DRIVER TRAINING 19
0—None
1—High School
2—Commercial
3—School Bus
4—Traffic School
5—Two or more Types
8—Training, Type Unknown
9—Unknown

VIOLATIONS CHARGED 20
0—No
1—Yes
2—Pending
9—Unknown

PREVIOUS RECORDED ACCIDENTS 21 22
Actual Value Except:
00—None
99—Unknown

PREVIOUS RECORDED SUSPENSIONS AND REVOCATIONS 23 24
Actual Value Except:
00—None
99—Unknown

PREVIOUS DWI CONVICTIONS 25 26
Actual Value Except:
00—None
99—Unknown

PREVIOUS SPEEDING CONVICTIONS 27 28
Actual Value Except:
00—None
99—Unknown

PREVIOUS OTHER HARMFUL MV CONVICTIONS 29 30
Actual Value Except:
00—None
99—Unknown

DATE OF LAST ACCIDENT, SUSPENSION, OR CONVICTION 31 34
Mo. Yr.
00—Not Applicable
99—Unknown

DATE OF FIRST ACCIDENT, SUSPENSION, OR CONVICTION 35 38
Mo. Yr.
00—Not Applicable
99—Unknown

RELATED FACTORS 39 40 41 42 43 44
See Instruction Manual, "Related Factors—DRIVER LEVEL"

HS Form 214A (Rev. 10/78)

GPO : 1978 O - 277-[illegible]

STATE CASE NO. ______________

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Form Approved
OMB No. 004R-5634

FATAL ACCIDENT REPORTING SYSTEM (1978) —PERSON LEVEL—

This report is authorized by The Highway Safety Act of 1966, P.L. 89-564. While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate and timely.

CASE NUMBER STATE (GSA Codes) 1 2 ☐☐

CONSECUTIVE NUMBER 3 6 ☐☐☐☐

TRANSACTION CODE 7 8 [3] ☐
31—Original Submission
32—Update or Change

CARD NO. 9 [1]

VEHICLE NUMBER 10 11 ☐☐
(Assigned by Analyst)
00—Non-Occupant

PERSON NUMBER 12 13 ☐☐
(Assigned by Analyst)

AGE 14 15 ☐☐
Actual Value
00—Up to One Year
97—Ninety-Seven Years or Older
99—Unknown

SEX 16 ☐
1—Male
2—Female
9—Unknown

PERSON TYPE 17 ☐
1—Driver
2—Passenger
3—Non-Occupant: Pedestrian
4—Non-Occupant: Pedalcyclist
7—Non-Occupant: Occupant of Non Traffic Unit Vehicle
8—Non-Occupant: Other or Unknown
9—Occupant: Unknown Type

SEATING POSITION 18 19 ☐☐
00—Not Applicable
01—Front Seat - Left Side (Driver's Side)
02—Front Seat - Middle
03—Front Seat - Right Side
04—Second Seat - Left Side
05—Second Seat - Middle
06—Second Seat - Right Side
07—Third Seat - Left Side
08—Third Seat - Middle
09—Third Seat - Right Side
10—Front Seat - Other
11—Second Seat - Other
12—Third Seat - Other
13—Other Passengers
14—Sleeper Section of Cab (Truck)
15—Riding on Vehicle Exterior
99—Unknown

ACTIVE RESTRAINT SYSTEM 20 ☐
0—None Used - Vehicle Occupant/Not Applicable - Non Occupant
1—Shoulder Belt
2—Lap Belt
3—Lap and Shoulder Belt
4—Child Safety Seat
6—Restraint Used - Type Unknown or Other
7—Motorcycle Helmet
9—Unknown

PASSIVE RESTRAINT SYSTEM 21 ☐
0—Not Applicable
1—Deployed Airbag
2—Non-Deployed Airbag
3—Passive Belt
9—Unknown

NON-OCCUPANT LOCATION 22 23 ☐☐
00—Not Applicable - Vehicle Occupant
01—Intersection - In Crosswalk
02—Intersection - Sidewalk, Median, Island, Other
03—Intersection - On Roadway
04—Intersection - Unknown
05—Non-Intersection - In Crosswalk
06—Non-Intersection - Sidewalk, Median, Island, Other
07—Non-Intersection - Bike Path
08—Non-Intersection - On Road Shoulder
09—Non-Intersection - Outside Trafficway
10—Non-Intersection - On Roadway
11—Non-Intersection - Unknown
99—Unknown

EJECTION 24 ☐
0—Not Ejected
1—Totally Ejected
2—Partially Ejected
9—Unknown

EXTRICATION 25 ☐
0—Not Extricated
1—Extricated
9—Unknown

DRINKING INVOLVED 26 ☐
0—No
1—Yes

ALCOHOL TEST RESULT 27 28 ☐☐
Actual Value (Decimal Implied before First Digit) (0.xx)
95—Test Refused
96—None Given
97—AC Test Performed, Results Unknown
99—Unknown

ALCOHOL TEST TYPE 29 ☐
0—Not Applicable/No Test
1—Blood
2—Breath
3—Urine
4—Saliva
5—Tissue
8—Other
9—Unknown

INJURY SEVERITY 30 ☐
0—O
1—C
2—B
3—A
4—K
5—Injured, Severity Unknown
7—Died Prior to Accident
9—Unknown

TAKEN TO HOSPITAL OR TREATMENT FACILITY 31 ☐
0—No
1—Yes
9—Unknown

DEATH DATE 32 37 ☐☐ ☐☐ ☐☐
MONTH DAY YEAR
000000—Not Applicable
999999—Unknown

DEATH TIME 38 41 ☐☐☐☐
Military Time Except:
0000—Not Applicable
9999—Unknown

RELATED FACTORS 42 43 ☐☐ 44 45 ☐☐ 46 47 ☐☐
See Instruction Manual "Related Factors—PERSON LEVEL"

HS Form 214B (Rev. 10/78)

CHAPTER IV

SUMMARIES OF COMMUNICATIONS WITH GOVERNMENT AGENCIES AND RESEARCH ORGANIZATIONS INVOLVED WITH SURFACE COAL MINING, LAND RECLAMATION, AND OTHER SMCRA-RELATED TOPICS

IV. SUMMARIES OF COMMUNICATIONS WITH GOVERNMENT AGENCIES AND RESEARCH ORGANIZATIONS INVOLVED WITH SURFACE COAL MINING, LAND RECLAMATION, AND OTHER SMCRA-RELATED TOPICS

PURPOSE

Examination of published studies (Chapter II) and known data sources (Chapter III) provides considerable information on the current state-of-the-art of research into surface mining and reclamation. A third source of information are the various public and private agencies that might, in some way, be involved in this field. This chapter describes contacts with these agencies. Generally speaking, these contacts were intended to:

- Determine if the contacted agency has been involved with assessing the socio-economic or environmental impacts of SMCRA, or is aware of such efforts by other groups.
- Determine if the contacted agency has been involved with assessing the socio-economic or environmental impacts of surface coal mining and land reclamation in general, or is aware of such efforts by other groups.
- Determine if the contacted agency either maintains data bases that are relevant to assessments of surface mining and reclamation, or can identify appropriate data sources.

If the contacted agency indicated that it had been involved in assessing relevant socio-economic or environmental impacts—or was aware of such efforts by other groups—additional questions were asked. The purpose of these questions was to:

- Determine if this work had been documented in a report and, if possible, to obtain a copy.
- Identify benefits and impacts that had been addressed.
- Identify assessment techniques that had been employed.

If the contacted agency maintained relevant data bases, or was aware of any such sources, the goal was to obtain more documentation on these data bases and, if appropriate, to determine the means of accessing them.

SELECTION OF CONTACTED AGENCIES

Relevant agencies were identified either through references contained in the literature, or on the basis of known or suspected agency involvement with some aspect of surface coal mining or reclamation. Contacts with the initial group of identified agencies led to the identification of other agencies, and of other reports and data bases which were subsequently reviewed. The process was an iterative one, with expanded activities in one area (literature review, data base evaluation, or agency contact) leading to the expansion of activities in other areas.

COMMUNICATION PROCEDURES

Communications with the various agencies and research organizations were initiated by telephone. When required by the contacted agency, a written request for specific information was submitted. In only one instance was an on-site visit necessary to gain access to available information; in all other cases, the information was provided by phone and/or through the mail.

Efforts to identify pertinent research groups, studies, and data sources occurred over the course of several months, with an intensive search taking place during a six-week period from mid-March to the end of April, 1980. Communications with relevant organizations have continued throughout the benefits study and will do so throughout the cost study.

COMMUNICATION SUMMARIES

In the following paragraphs, we summarize the results of our communications with the various agencies and research organizations. These summaries are presented in the following categories:

I. Communications Relating to General Socio-Economic and Environmental Impacts of Surface Coal Mining
II. Communications Relating to Personal Injury and Property Damage Associated with Surface Coal Mining
III. Communications Relating to Land Characteristics
IV. Communications Relating to Land Reclamation
V. Communications Relating to Agricultural Activities Affected by Surface Coal Mining
VI Communications Relating to Residential Activities Affected by Surface Coal Mining
VII Communications Relating to Fish and Wildlife Affected by Surface Coal Mining
VIII. Communications Relating to Fragile, Historic, and Similar Land Affected by Surface Coal Mining
IX. Other Communications.

I. Communications Relating to General Socio-Economic and Environmental Impacts of Surface Coal Mining

1. Bureau of National Affairs, Inc., Washington, D.C.

In the course of communications with the Twin Cities Research Center of the U.S. Bureau of Mines, it was learned that the Bureau of National Affairs (BNA) might publish information of potential relevance to this study. Subsequent communications with BNA revealed that the material in question is a subscription service and that it reports on such topics as: major actions by Federal and state agencies in the environmental area; pertinent changes and developments in Federal and state environmental regulations; and important court rulings on environmental issues. This service is not specific to mining activity.

2. Council on Environmental Quality, Washington, D.C.

   The Council on Environmental Quality was contacted to determine if it has done, or is aware of, any economic assessments of the environmental impacts of SMCRA. The Council indicated that it has not done any work relating to the environmental impacts of the Act. The only publications it could suggest were ICF Inc.'s Energy Impacts of H.R.13950, Surface Mining Control and Reclamation Act of 1976 (done for the Council on Environmental Quality in 1977), and A. Myrick Freeman's The Benefits of Environmental Improvement, Theory and Practice (Johns Hopkins University Press, 1979). The ICF report, while very significant, addresses costs and not benefits; the Freeman report does not specifically address mining activity and deals mainly with the theoretical and methodological issues of evaluating impacts.

3. Environment Information Center, Inc., New York, New York

   The Environment Information Center was identified as a potential information source by the Twin Cities Research Center, U.S. Bureau of Mines. Subsequent contact with the Center revealed the source to be subscription service data base reporting on matters relating to energy and the environment. Although requested by the study team, no additional information on the contents of this data base was provided.

4. Environmental Impacts Division, Office of Technology Impacts, U.S. Department of Energy, Washington, D.C.

   Information was requested concerning impacts that are associated with surface coal mining, reclamation, and/or SMCRA. This inquiry encompassed work done by DOE as well as research done by other agencies. It was found that the Environmental Impacts Division is currently doing little in these areas, and that most of DOE's research activities into surface mining and reclamation are conducted through the Argonne National Laboratory.

5. Argonne National Laboratory, Argonne, Illinois

   Information was requested concerning research that the Argonne National Laboratory might be conducting, or be aware of, in assessing the socio-economic and environmental impacts of surface coal mining, reclamation, and/or SMCRA. It was found that the Laboratory collects information relating to both benefits and costs of mined land reclamation, and that attention is primarily directed toward social benefits. A list of potentially relevant studies was provided by Argonne; available studies from this list have subsequently been acquired and reviewed. On the strength of the information obtained about Argonne's activities, a subsequent visit was made by the study team to the Laboratory; results of this meeting are discussed in Chapter V.

6. Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C.

   Information was requested concerning research that EPA might be conducting, or be aware of, in assessing the socio-economic and environmental impacts of surface coal mining, reclamation, and/or SMCRA. It was found that: EPA has not conducted research that is SMCRA-specific; benefit assessments made by the Agency relate to activities within its jurisdiction; and impacts associated with air and water pollution, and land disturbance (not necessarily mine-related), had been addressed. A list of potentially relevant EPA publications was obtained; relevant studies were subsequently acquired and reviewed.

7. Office of Water Planning and Standards, U.S. Environmental Protection Agency, Washington, D.C.

   Information was requested to determine how EPA's information system on water quality, the National Pollutant Discharge Elimination Systems (NPDES), can be accessed, and to identify any work that the Office may have done in making economic assessments of water quality. Results of this inquiry are that: NPDES is a manual, not computerized, information system; NPDES data is maintained in EPA's regional offices; accessing NPDES would probably be very time-consuming; and operating coal mines maintain this data on their Discharge Monitoring Report Form.

8. Office of Coal Management, Bureau of Land Management, U.S. Department of the Interior, Washington, D.C.

   Information was requested concerning assessments that the Office of Coal Management may have made of the impacts of SMCRA. It was learned that the Office has published a number of environmental impact statements that identify the socio-economic impacts of coal mine development in Alabama and the West. A list of these impact statements and a sample copy of one of them were obtained.

9. Office of Environmental Compliance and Review, U.S. Department of the Interior, Washington, D.C.

   Information was requested concerning work that the Office of Environmental Compliance and Review may have done in assessing the environmental impacts of SMCRA. This Office, while aware of the existence of such research, is not involved with it and provided no additional information.

10. Colorado Department of Natural Resources

    Information was requested concerning work that the Department is doing, or is aware of, in assessing the socio-economic and environmental impacts of surface coal mining, reclamation, and/or SMCRA in Colorado. It was found that: the Colorado Bureau of Land Management is preparing documentation to support coal leasing activities in the state; the Colorado Mine Reclamation Office may have potentially relevant information concerning such assessments; and the Department is concerned with enforcement and is not involved directly in research of any type.

11. New Mexico Bureau of Mines, Sirocco, New Mexico

    Information was requested concerning assessments of the socio-economic and environmental impacts of surface mining, reclamation, and/or SMCRA. A study by the New Mexico Bureau on Coal Reclamation was identified as being potentially relevant; a copy was subsequently obtained. Other state agencies—the State Planning Office and the Environmental Improvement Division—were identified as being other potential information sources.

12. Bureau of Surface Mining, New Mexico Department of Energy and Minerals

    Information was requested concerning assessments that the Bureau may have made of the socio-economic and environmental impacts of surface coal mining and reclamation. The Bureau indicated that it has had no involvement in this type of activity.

13. Pennsylvania Bureau of Surface Mine Reclamation, Harrisburg, Pennsylvania

    Information was requested concerning research that the Bureau is doing, or is aware of, in assessing the socio-economic and/or environmental impacts of surface mining, reclamation, and/or SMCRA. The Bureau indicated that while beneficial impacts are acknowledged to occur as a result of reclamation, they are not readily quantified. The Bureau identified several information sources: two studies done by Ackenheil and Associates (into mine discharge problems); the Citizens Advisory Council of the Bureau of Surface Mining; and the Institute for Research for Land and Water Resources, Pennsylvania State University.

of Tennessee,
Knoxville, Tennessee

Information was requested concerning work that EERC is doing in evaluating impacts that are associated with surface mining and reclamation. The Center indicated that its work originated in 1972 and was at that time primarily concerned with assessing economic damage caused by surface mining in northeast Tennessee. Present work is primarily concerned with the impacts of surface mining on water quality in selected watersheds, and with other water-related issues (e.g., damage caused by flooding). Much of this work is documented in studies published by the Center; a number of these studies are summarized in Appendix 1 of this report. Contacts with EERC have been very valuable to this study; EERC was active in planning and participating in an information-gathering trip by the study team to the surface coal mining region in Tennessee (see Chapter V for details).

15. Virginia Division of Mined Land Reclamation, Big Stone Gap, Virginia

Information was requested concerning research that Virginia is conducting, or sponsoring, to assess the socio-economic and environmental impacts of coal mining and reclamation. It was found that: coal mining in the state is in a depressed condition; the depressed state of the industry is attributed to both SMCRA and the present poor market for coal; and there is evidence to suggest a trend away from surface mining toward underground mining. Several other information sources were suggested by this agency: the Virginia Surface Mine and Reclamation Association, the U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers.

II. Communications Relating to Personal Injury and Property Damage Associated with Surface Coal Mining

1. Soil Conservation Service, U.S. Department of Agriculture (USDA), Washington, D.C.

Information was requested concerning the Department's possible involvement in the development of damage functions for abandoned coal mines. Results of this inquiry are that: the Soil Conservation Service coordinates USDA's research efforts in the land reclamation field; USDA, while maintaining an abandoned mine land data base, has not conducted research into the creation of damage functions for such land; major reclamation benefits could be expected for land surrounding a reclamation site; and socio-economic impacts would be particularly significant in western states where mining operations can result in "boom town" conditions (e.g. population explosions with which affected communities cannot cope).

2. Operations Center, Federal Emergency Management Agency (FEMA, formerly Federal Disaster Assistance Administration), Washington, D.C.

   Information was requested concerning any data that the Operations Center might have on personal injury or property damage that is attributable to surface coal mining. The Center indicated that FEMA coordinates federal disaster relief, and that state or local agencies might be better able to provide information of the type desired.

3. Plans and Preparedness Group, Federal Emergency Management Agency, Washington, D.C.

   Information was requested concerning personal injury and property damage that might be associated with surface coal mining. The Plans and Preparedness Group suggested that we contact the Office of Natural Hazard Reduction and Evaluation, and the Office of Natural and Technical Hazards, for further information.

4. Office of Natural and Technical Hazards, Federal Emergency Management Agency, Washington, D.C.

   Information was requested on personal injury and property damage that might be associated with surface coal mining. The Office suggested the following information sources: the Energy, Environment, and Resources Center, University of Tennessee; the Argonne National Laboratory; State Departments of Natural Resources; state universities pursuing research into surface mining and reclamation; and the Mine Safety and Health Administration, U.S. Department of Labor.

5. Mine Safety and Health Administration (MSHA), U.S. Department of Labor, Washington, D.C.

   Information was requested concerning the types of personnel who are of concern to MSHA, the extent to which the agency deals with mishaps occurring away from a mine site, and the nature of the injury data that it possesses. Results of these inquiries are that: any person injured at a mine site, while the mine is in operation, is of official concern to MSHA; the relevance to MSHA of accidents occurring away from a mine site is determined on a case-by-case basis; MSHA's computer center in Denver, Colorado maintains the agency's accident data base and generates its accident reports; and accident data is usually between 1 and 2 years old by the time it is released. MSHA also indicated that it has a working relationship with the National Institute of Occupational Safety and Health (NIOSH) (National Institutes of Health, Bethesda, Maryland).

6. Mine Safety and Health Administration (MSHA), U.S. Department of Labor, Denver, Colorado

   Information was requested concerning injuries that might be associated with surface coal mining. MSHA's Denver office referred us to the agency's Safety Analysis Center, also in Denver, for further information. On being contacted, the Safety Analysis Center forwarded a copy of its data collection form to indicate the type of data that it collects.

7. National Statistics and Analysis Office, National Highway Traffic Safety Administration (NHTSA), U.S. Department of Transportation

   Information was requested on the availability of data that pertains to mine-related traffic accidents. It was found that NHTSA has no data that applies to accidents that do not occur on public roads. The agency does maintain a data base on fatal accidents occurring on public roads; this data base can be accessed to the county level. NHTSA suggested the National Center for Health Statistics as another potential source of information on mine-related accidents.

III. Communications Related to Land Characteristics

1. Soil Survey Classification and Correlation Division, Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C.

   Information was requested concerning measures of soil quality and on how this quality might be affected by surface mining and reclamation. The Soil Conservation Service maintains a Soil Interpretive data base at Iowa State University that reports on various soil characteristics for undisturbed land; use of this data is not appropriate for site-specific or county-level analyses. Data for site-specific analyses can be obtained from sources such as local soil conservation offices which can be identified by the state conservationist in a given state.

   In addition, soil surveys have been conducted and the results published for approximately 60% of the country; unfortunately, the surveys are largely unavailable for much of the West and for Illinois. Where available, these surveys provide information on such characteristics as soil quality, soil properties, and suitability of sites for soil-dependent applications.

2. U.S. Geological Survey (USGS), U.S. Department of the Interior, Washington, D.C.

   The U.S. Geological Survey was contacted to determine if it publishes maps or other documentation that identifies: areas prone to flooding; areas prone to landslides; roadways; topography; and surface water elevations. It was found that such maps are available. Each map covers a "quadrangle", i.e., area of approximately 14 square miles. Topographic, geologic, landslide, and hazardous lands maps are available from USGS, Washington, D.C.; maps pertaining to flooding are obtainable from the USGS in each state.

IV. Communications Relating to Land Reclamation

1. Division of Environment, Bureau of Mines, U.S. Department of the Interior, Washington, D.C.

Information was requested concerning the socio-economic or environmental impacts that are associated with surface coal mining. The Division indicated that it does much of the environmental work for the Bureau of Mines, and that sometimes this work has been done in conjunction with agencies such as EPA. The Division felt that much of the relevant work would apply to areas covered by Title 5 of SMCRA, and provided a list of pertinent studies.

2. Illinois Department of Agriculture, Springfield, Illinois

Information was requested concerning studies that the Department is conducting, or is aware of, on mine land reclamation in the state. The Department indicated that it is in the process of developing an information bank on mine land reclamation and finding that this information is fragmentary. It is also developing a methodology for estimating crop yield, i.e. a measure of land productivity, based on soil type. The Department also suggested other information sources: the School of Agriculture at the University of Illinois (Champaign-Urbana), and the National Academy of Sciences, Washington, D.C.

3. School of Agriculture, University of Illinois, Champaign-Urbana, Illinois

Information was requested concerning research that the University is conducting, and data bases it is developing, on mine land reclamation in the state. The University indicated that it is currently engaged in extensive research into the impacts of reclamation on farming, but that this work is still preliminary and will not be published for another 12-18 months. The University added that it is still too early (i.e. too close to the date of enactment) to evaluate in any detail the effectiveness of SMCRA, and that, depending on conditions, SMCRA will prove both more and less effective than the pre-SMCRA state law. The University also noted that, based on inconclusive evidence, SMCRA's required reclamation procedures have generated crop yields not markedly different from those obtained under the state regulations.

4. Division of Reclamation, North Dakota Public Service Commission

Information was requested from the Office of the Assistant Director, Division of Reclamation, concerning any research (or data bases) that the Division has conducted (or developed) on mine land reclamation.

The agency indicated that it has not undertaken any research in this area. It added, however, that North Dakota State University has conducted a comparative study of reclamation costs before and after the passage of P.L. 95-87.

5. Division of Land Quality, Wyoming Department of Environmental Quality.

   Information was requested to determine if Wyoming had, or is, conducting any research, or developing any data bases, that relate to mine land reclamation or other SMCRA-related topics. The Division indicated that the state itself has not conducted any such research. It added that the University of Wyoming has conducted several small studies, but that these are of uncertain credibility. The Division also suggested other potential sources of information: the Wyoming Outdoor Council (Cheyenne, Wyoming); the Powder River Resources Council (Buffalo and Sheridan, Wyoming); and the local conservation district offices (with contact to be made through the state Soil Conservation Service, Casper, Wyoming).

V. Communications Relating to Agricultural Activities Affected by Surface Coal Mining

1. Economic Research Service, U.S. Department of Agriculture, Washington, D.C.

   Information was requested on the productivity of land and on the prices that are received for major agricultural commodities, i.e. commercial crops and livestock. Special attention was devoted to obtaining this information at the sub-state (e.g. county) level. The Economic Research Service indicated that current state-level data is available from the Economics, Statistics, and Cooperatives Service of USDA; two publications by this group, Annual Crop Production Report and Agricultural Prices, are especially relevant. The Service added that: USDA's annual Agricultural Statistics is a very comprehensive source of state level data; county- and state-level production and price data is available from the State Crop Reporting Boards; published county-level data is between 1 and 2 years old; information on input factors for agricultural production is available through state-specific cost-of-production budgets obtainable from a federal data base maintained at Oklahoma State University; and information on factors affecting production at the local level can be obtained from affected county agents.

2. Forest Economic Staff, Forest Service, U.S. Department of Agriculture, Washington, D.C.

   Information was requested on the productivity of land and on the prices that are received for forest products. The Staff indicated that: price data for forest products is only available from state forestry departments that collect such data (not all states do); a certain amount of forestry production data is available from the Bureau of the Census' Current Industrial Report Series - Lumber Products and Mill Stock; published data on costs of forestry production is virtually nonexistent; the major factor affecting forest production is the demand for lumber products; and data bases for forest products are not as well developed as those for crops and livestock.

3. State Statistician-in-Charge, Illinois Department of Agriculture

   Information was requested on price and production data for major agricultural products in Illinois. It was learned that both price and production data is available, and that production data is subdivided into volume of commodities produced and volume of commodities sold. (By comparing the two volumes for forage crops, one can infer the level of livestock activity that takes place in the reporting area.) Most of the county data comes from 1978, and copies of available data were obtained. Studies are underway in Illinois to study the impacts of mined land restoration on agriculture.

4. State Statistician-in-Charge, Tennessee Department of Agriculture

   Information was requested on price and production data for major agricultural products in Tennessee. It was learned that: production data for major crops is available at the county level; price data for major crops is available at the state level; the 1978 Census of Agriculture is being released; and Census and state data differ, but only slightly. Copies of available state data were obtained.

VI. Communications Relating to Residential Activities Affected by Surface Coal Mining

1. Building Permits, Bureau of the Census, U.S. Department of Commerce, Washington, D.C.

   Information was requested on building permit and housing start data at the county level. By comparing this data under pre- and post-SMCRA conditions, it might be possible to detect differential impacts of the Act on housing. It was learned that: national data bases do not contain housing start data at the county level; data on building permits is available from the Census Bureau; the most recent year for which data is available is 1978; annual building permit data is available for the jurisdictions in a state that issue such permits; and building permit data does not apply to mobile homes (a potential deficiency since this may be the prevalent form of housing in many mining communities). A Census publication was suggested by the Building Permits group: Housing Authorized by Building Permits and Public Contracts. A 1978 copy of the publication was obtained.

2. Federal Home Loan Bank Board, Washington, D.C.

   Information was requested on the following types of data: number of pending home loan applications; number of home loans; the value of home loans; the price of houses; other measures of housing activity and value, especially at the county level. It was learned that the Federal Home Loan Bank Board possesses no data on issued or pending home loans. However, data is available on the purchase price of homes and the amounts of mortgages. Copies of the agency's available housing information were obtained.

3. Land Planning and Land Use Office, U.S. Department of Housing and Urban Development, Washington, D.C.

   Information was requested on the following topics: evaluation of mined land for reclamation purposes; suitability of reclaimed land for residential construction; activity levels of home construction; and housing prices. In response to this inquiry, the Office suggested that: the engineering group within the Federal Housing Administration should be contacted for information on evaluation criteria for specific land sites; little data existed, at the county level, on home construction activity, home sales, and housing prices; and available county level data might be accessed through HUD's Economic Market Analysis Division. In addition, the Office suggested that we contact the National Home Builders Association as another source for housing information.

4. Economic Market Analysis Division, U.S. Department of Housing and Urban Development, Washington, D.C.

   Information was requested on housing activity and prices at the county level. The Division identified the Bureau of the Census and the Federal Home Loan Bank Board as sources for this data. (Contacts with both sources have been described above.)

5. Engineering Division, Federal Housing Administration, U.S. Department of Housing and Urban Development, Washington, D.C.

   Information was requested on criteria for evaluating reclaimed land for residential construction. In response to this inquiry, it was learned that: a generalized set of specific criteria to evaluate reclaimed land (mined or otherwise) is, given the diversity of encountered conditions, probably of limited practical value; earth swell is a major source of property damage in the U.S.; the impacts of effluent discharges depend on the robustness of the environments receiving them; consideration of a mine site for housing is relevant only if it is close to a population center that could utilize the added housing; and the types of factors to be considered in evaluating sites for housing are contained in HUD's Data Sheet 79g (June 19, 1973). A copy of this document was obtained.

VII. Communications Relating to Fish and Wildlife Affected by Surface Coal Mining

1. Sport Fishing Institute, Washington, D.C.

   Information was requested on the availability of conversion factors that would translate changes in sport fishing catches to monetary terms. If reclamation enhances the aquatic environment for fish species used for sport, increased fish landings following reclamation could be converted to obtain a monetary estimate of this reclamation benefit. The Institute recommended three potential sources for this information: the American Fisheries Society (Bethesda, Maryland); Replacement Value of Fish, published by the Fisheries Division, Tennessee Wildlife Resource Agency, Nashville, Tennessee; and Reimbursement Values of Fish, published by the Department of Zoology, University of Wisconsin.

2. National Marine Fisheries Service, U.S. Department of Commerce, Washington, D.C.

   Information was requested on the numbers of fresh water fish, both commercial and sport species, that are landed annually. The Service indicated that one of its publications might be relevant: Fisheries Statistics of the U.S., 1975. A copy of this publication was obtained.

3. Eastern Energy Land Use Group, U.S. Department of the Interior, Leetown, West Virginia.

   Information was requested on the impacts of surface coal mining, reclamation, and/or SMCRA on fish and wildlife. The Group noted that fish and wildlife data bases are being developed in Alabama and West Virginia, and are potentially relevant. In addition, the group noted that the Department's Office of Biological Services has published a series of documents that might be helpful to the current study. A number of these documents were subsequently obtained.

4. Division of Wildlife Ecology Research, Office of Biological Services, U.S. Department of the Interior, Washington, D.C.

   Information was requested on research that the Division might have conducted into the impacts of SMCRA on wildlife. The Division identified the Coal Project of the Office of Biological Services as the appropriate group to contact.

5. Coal Project, Office of Biological Services, U.S. Department of the Interior, Washington, D.C

   Information was requested on any work that the Coal Project may have done on the possible effects of SMCRA on fish, wildlife, and the general environment. The Project indicated that approximately 40 potentially relevant projects had been undertaken since 1975; a list of these projects was obtained.

6. Division of Fishery Ecology Research, Office of Biological Services, U.S. Department of the Interior, Washington, D.C.

   Information was requested on the possible impacts of surface coal mining, reclamation, or SMCRA on fish species. The Division suggested the following information sources: the Eastern Energy Land Use Group, the Sport Fishing Institute, and the groups within the Office of Biological Services (discussed above).

7. Environmental Affairs Office, Water and Power Resources, U.S. Department of the Interior, Washington, D.C.

   Information was requested to determine if the Environmental Affairs Office had conducted any research into the possible impacts of SMCRA on fish, wildlife, and water quality. The Office indicated that it is primarily concerned with preparing environmental impact statements for activities started before the Act's passage, and for activities being conducted in the West.

8. Game and Fish Division, Alabama Department of Conservation

   Information was requested on the fish and wildlife data base that is being developed for Alabama. The Division indicated that the State has conducted three fish and wildlife assessments over the last several years. One of these assessments is contained in a document entitled Summary of Fish and Wildlife Information for Alabama; because its data has not been fully validated, the document is not yet available to the public. This document contains data on over 1,000 species, classified by factors such as county of location and type of supporting vegetation. Information on the other two assessments can be obtained from the State Planning Division, Alabama Office of State Planning and Federal Programs; and the Statewide Comprehensive Outdoor Recreation Plan, School of Agricultural Economics, Auburn University.

VIII. Communications Relating to Fragile, Historic, and Similar Land Affected by Surface Coal Mining

1. Heritage Conservation and Recreation Service, U.S. Department of the Interior, Washington, D.C.

   Information was requested concerning land that, by its nature, would be difficult or impossible to reclaim. Particular attention was directed to historic, fragile, and similar lands that are of specific concern to SMCRA. The Service suggested the following information sources: Office of Environmental Compliance and Review; Division of Preservation Policy; and Division of State Heritage Programs. A publication, the National Register of Historic Places, 1979, was also recommended as containing potentially relevant information.

2. Division of Preservation Policy, U.S. Department of the Interior, Washington, D.C.

   Information was requested on research that the Division may be conducting on the assessment or valuation of historic, cultural, or scientifically significant lands. The Division indicated that the Department of the Interior is developing a demand/benefit model that will assign a quantitative measure of value to the preservation of historic places. The Division suggested other sources of information: the Office of Policy Analysis, U.S. Department of the Interior; the State Planning Division, Heritage Conservation and Recreation Service, U.S. Department of the Interior; and the Advisory Council on Historic Preservation.

3. Division of State Heritage Programs, U.S. Department of the Interior, Washington, D.C.

   Information was requested on work that the Division may have done in the areas of national landmarks, nationally significant lands, and fish and wildlife. The Division indicated that it is not aware of any work being conducted in these areas.

IX. Other Communications Summaries

1. Office of Program and Policy Planning, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C.

   Information was requested on quantified measures of value that could be assigned to the construction and/or use of roads—especially coal roads. The Office indicated that it expects to become involved in developing measures to value coal roads, but that none now exist. One of the Office's recently completed reports, Coal Road Study, may contain useful information, but this report has not yet been released by the Secretary of Transportation.

FINDINGS

Many of the contacted agencies recommended other organizations, studies, or data bases that they felt might be of value. As many of these recommended agencies as possible were contacted for further information; recommended reports were obtained when available, and have been reviewed.

The preceding summaries reveal differing degrees of knowledge among the organizations that might be expected to have some involvement with surface mining and reclamation. The most knowledgeable groups appear to be those involved with agriculture, technical evaluations of soils characteristics, and fish and wildlife.

From the communications described above, two significant trends have emerged on the availability of data. First, much of the relevant data is available only at the state or national levels. Second, county level data, when available, is often several years old. Taken together, these trends indicate that the ability to make site-specific "pre-post" assessments of SMCRA benefits is, at present, very limited.

It should be emphasized that the preceding summaries reflect the knowledge of the agency spokesmen, and may not reflect the knowledge possessed by others in the respective agencies. While some of the spokesmen were subsequently proven to be well informed, there is reason to suspect that others were relatively uninformed about the work conducted by their agencies. At times, conflicting information was provided and had to be further clarified. This uneven state of knowledge complicates the task of identifying valuable information sources whose existence cannot be readily established by other means.

CHAPTER V - SUMMARIES OF INFORMATION-GATHERING TRIPS TO COAL-PRODUCING REGIONS IN MONTANA AND TENNESSEE

V. SUMMARIES OF INFORMATION-GATHERING TRIPS TO COAL-PRODUCING REGIONS IN MONTANA AND TENNESSEE

INTRODUCTION

Regulatory agencies, and researchers who assess them, generally assume that socially adverse impacts will occur unless certain types of activities are subjected to public control. Curtailment or elimination of these adverse impacts is a benefit that is generally attributed to regulatory efforts. Past experience has shown, however, that the intended and actual benefits of these regulatory efforts can sometimes be perceived and measured differently by enforcement officials, those affected by them, and research groups. To investigate this possibility for SMCRA and OSM, visits were planned to regions that experience significant levels of surface coal mining activity. Constraints on study resources limited the number of these visits to two.

OBJECTIVES OF BENEFITS-RELATED VISITS

It was decided to contact groups in mine-affected areas who would probably have documented and/or established views on surface mining, reclamation, and/or SMCRA. These groups include citizen and environmental groups, individual mine operators and their associations, and Federal and State agencies involved with surface mining activities. It was hoped that spokesmen for these groups would provide insights into one or more of the following areas:

- Pre-SMCRA mining and reclamation activities and their associated benefits and socio-economic/environmental impacts
- Experience to date with mine operations under the SMCRA operating environment
- Future implications of SMCRA for individual mines, the region's coal mining industry, persons living in the vicinity of mining operations, and the environment in general
- The relevance and reasonableness of assumed SMCRA benefits for the region
- Evidence documenting the effectiveness of the regulations and their enforcement in bringing about intended benefits.

Comments on any other topics related to mining, reclamation, and/or SMCRA were welcomed.

Our review of prior studies suggested that much of the work resulting in quantified estimates of benefits was done on a local basis by research groups located in or near the study region. It was decided, therefore, to attempt to arrange meetings with research groups that had been active in the areas to be visited. It was hoped that spokesmen for these groups would provide information on:

- Past research activities that relate to surface mining, land reclamation, and/or SMCRA
- Data availability in terms of type, quality, and quantity
- Their perceptions of how surface mining has affected the visited regions, and what effect SMCRA has had, and might have, in the future
- Other areas that they feel are relevant to SMCRA-related activities.

In addition, it was decided to solicit the views of these spokesmen on the feasibility and desirability of conducting comprehensive economic assessments of SMCRA on a state, regional (multiple-State), and national basis.

CRITERIA FOR SITE SELECTIONS

In selecting sites to be visited, five criteria were employed:

- Each selected site should be in a major coal producing region, i.e., Appalachia, the Midwest, or West.
- If possible, each selected site should be in a region in which assessments of mining and/or reclamation have been performed.
- If possible, each selected site should have at least some published material (e.g. data or studies) on the impacts of its mining and reclamation operations.
- At each selected site, a willingness should be demonstrated, by parties with conflicting views, to participate in the study team's information-collection efforts. This criterion was imposed as a result of the constraints that limited the number of site visits that could be made.
- At least one site should reflect severe environmental damage that has resulted from surface coal mining operations.

In implementing these criteria, contacts were initially made with the State agencies regulating surface mining in major coal producing states. The purpose was to determine:

- The amount of research information that exists on surface coal mining and reclamation in the State

- The probable willingness on the part of interested parties in the State to cooperate with members of the study team
- The willingness of the agency to cooperate with the information collection effort, e.g., to coordinate the scheduling of meetings prior to the study team's visit.

Similar contacts were made with research groups that were known to have been active in the contacted States.

SELECTED SITES

The State of Montana is one of the West's largest coal producers. Its program for enforcement of SMCRA is at least as strict as the Act's permanent Federal regulations, and has been approved by OSM for enforcement of the Act. In addition, surface mining and reclamation have been the subject of considerable research in Montana, and all interested parties, including affected government agencies, expressed an interest in participating in the study team's visit. For these reasons, Montana was selected as one of the States to be visited. Montana's Department of State Lands, which is responsible for the State's surface mining program, arranged the itinerary for this trip.

The visit to Montana was scheduled in such a way that the study team would have an opportunity to stop in Chicago and visit the Mine Land Reclamation group at the Argonne National Laboratory. This group has been very active in reclamation research for the Western and Midwestern States, and a visit with it was deemed most valuable.

While not one of Appalachia's biggest coal producers, Tennessee has experienced severe environmental damage from surface coal mining. In addition, its mine operators have voiced considerable opposition to SMCRA and OSM. Furthermore, the Energy, Environment, and Resources Center (EERC) of the University of Tennessee has conducted major research into the mining and reclamation activities in the State, and expressed considerable interest in our own research efforts. For these reasons, an information-gathering visit was also scheduled for Tennessee. Through its contacts with environmental, mining, and research interests, EERC was able to arrange an extensive itinerary for the visit.

It should be noted that a number of States expressed a willingness to cooperate with this study. In selecting Montana and Tennessee, the study team felt that it could maximize the return on the limited number of benefits-related trips that were allowed by the available resources. The decision not to visit other States is not an adverse reflection on their willingness to cooperate, or on the potential value of the information they might have provided.

TRIP SUMMARY, TENNESSEE

The Energy, Environment, and Resources Center (EERC) at the University of Tennessee has, over the past eight years, conducted extensive analyses of the impacts of surface coal mining and land reclamation in northeastern Tennessee. Over this period of time, it has developed a working relationship with: other research organizations studying the Appalachian coal mining situation; citizen and environmental groups concerned with surface mining's environmental and social impacts; individual mine operators and their associations; and Federal and State agencies concerned with coal mining and its consequences. As a result of phone conversations and letter exchanges, EERC agreed to plan and coordinate a visit by the study team to Tennessee, and to actively participate in the team's activities during the visit. Meetings in Tennessee occurred between May 19, 1980, and May 21, 1980; during this period, the study team met with representatives of virtually all of the region's organized groups who are interested in coal mining and reclamation. Summaries of these meetings are presented below.

Summary of Meetings with EERC Staff

- EERC has been involved since 1972 with the environmental, economic, and social assessments of surface coal mining in Tennessee. These assessments have been conducted on a site-specific basis for selected watersheds in the northeast part of the State. This research has been sponsored by various Federal and State agencies, and by the National Science Foundation.

- In the Tennessee coal fields, much of the damage associated with surface coal mining is water-related, i.e., damage is primarily attributable to flooding, sedimentation, and siltation. Most of the reported damage has been to property, e.g., farmland and crops. With regard to water-related impacts, EERC has:

  - created a model that simulates water flows in the New River. On the basis of studies done with the model, it was concluded that river flows are higher than would be expected from natural causes; an increase in the area's mining activity is a possible explanation for these increased flows. (This model is discussed in more detail in one of the reviewed studies—see Appendix 1.)

  - studied the relationship between the extent of land disturbed and the level of water quality. It was found that variations in land disturbed do not fully account for the observed variations in water quality. Differences in mining methods are proposed as an explanation for the varying effects of mining on water quality.

- In its study of the impacts of mine-related sedimentation, EERC has found that:
  - efforts at back-to-contour reclamation in Tennessee have not significantly mitigated the sedimentation problem. EERC evaluated the effectiveness of back-to-contour reclamation on a study plot. Significant rill and gully problems were noted, and the observed sediment load of the plot's runoff remained significant. However, it should be added that the form of back-to-contour reclamation used at the site did not capitalize on provisions in SMCRA that permit the use of terraces, diversion ditches, and other techniques that might have alleviated these conditions.
  - a small watershed, Anderson Branch, which was reclaimed in accordance with SMCRA, exhibited some evidence that its restoration was more satisfactory than the restoration of other mine-affected watersheds not reclaimed under SMCRA. Anderson Branch exhibited a higher degree of damage prevention and a faster recovery rate for damage incurred.
  - revegetation efforts have not eliminated the sedimentation problem; soil disturbed by mining has not behaved as it did before mining took place.
  - use of sedimentation basins in very steep mining operations may not be the most effective way of dealing with sediment. Leaving benches on the reclaimed sites and utilizing head-of-hollow fills are suggested as being potentially more effective alternatives.
- In its study of siltation, EERC has found that as siltation levels increase, they result in drastic declines in diatom (i.e., algae), fish, and insect populations in and around mine-affected waters. The number of species of diatoms is a particularly sensitive indicator of water quality; in one study, the number of species declined from 150 prior to mining to virtually zero after mining. The effects of siltation were so dominant that it was difficult to identify similar effects that heavy metals or chemical pollutants (i.e., other effects of surface mining) may have on such populations. Over a 25-year period following mining, however, it was found that much of the damage tends to be corrected by natural reclamation.
- In the Anderson Branch experiment, reclamation under SMCRA slightly mitigated the deleterious effects of siltation, but perhaps by not enough to justify the costs that are involved with such reclamation.
- The natural recovery of watersheds is continually impeded by remining activities (i.e. mining operations on previously mined sites). The suggestion was made that such activities should be controlled in order to allow full ecological recovery in certain mined areas.

- In regard to the impacts that reclamation and SMCRA may have on the environment, EERC noted that:
    - it is necessary to determine the amount of environmental damage that SMCRA may actually abate. The primary concern should be the environmental implications of reclamation, not the method of reclamation itself. In this light, it is necessary to examine the effectiveness not only of SMCRA's specified reclamation techniques but of alternative techniques as well.
    - certain benefits of back-to-contour reclamation, e.g., aesthetic enhancement and improved opportunities for recreation and residential construction, will only be fully realized in areas where people live and/or visit. The benefits of such reclamation are less fully realized in remote, uninhabited areas that may remain unused after mining; much of the surface mined land in Tennessee occurs in remote, sparsely populated areas.
    - the preservation and replacement of topsoil that accompanies concurrent reclamation is of diminished value under very steep slope mining conditions in Tennessee; little arable soil exists to be protected under these conditions.
    - compaction of backfills constitutes a problem, and the stability of fills restored to approximate original contour remains questionable. It was suggested that maximum lifts of 12" to 18" would alleviate this problem.
    - the existence of extensive limestone deposits in much of the Tennessee coal field appears to reduce substantially the problem of acid mine drainage.
    - unless acid or toxic drainage is a serious problem, attempts to reclaim abandoned mine land through land disturbance may do more harm than good. Such reclamation may reverse the natural restoration that often occurs with the passage of time.
- With regard to the potential effectiveness of SMCRA, it was noted that a substantial amount of wildcatting occurs in Tennessee. Since these operations take place without mining permits, they are little affected by the Act. Because they are unregulated, these operations can be extremely destructive, even when their numbers and the areas disturbed are small. When SMCRA's permanent regulations take effect, it is suspected that the practice of wildcatting may become even more pervasive.
- In EERC's view, based on its own research experience, meaningful assessments of the impacts of SMCRA can only be conducted for specific sites, e.g., watersheds. Before similar work can commence for larger study regions, e.g., a State or the entire country, extensive work remains to be done to:

  - establish needed economic, scientific, and social data bases for such analyses.
  - understand the basic physical properties that are part of, or affect, reclamation processes.

Summary of Meetings with Staff of Oak Ridge National Laboratory (ORNL)

- Members of the study team met with representatives of the Energy, Environmental Research, and Health and Safety Divisions of ORNL.
- Representatives from the Energy Division indicated that:
  - ORNL has examined laws pertaining to the reclamation of abandoned mine land and has concluded that primary enforcement responsibility should lie below the national level.
  - preliminary work is underway at ORNL to compile data on problem areas that exist at specific mine sites. Results of this effort will be presented in graphic form.
  - evidence to date suggests that OSM is providing the States with a stimulus to undertake activities that they might otherwise ignore.
  - based on the observations of the staff of ORNL, OSM inspectors appear well qualified to enforce SMCRA and its regulations.
  - both Federal and state mine inspectors will, on occasion, interpret certain aspects of the mining and reclamation laws less strictly in order to obtain voluntary compliance by the operators in other, hopefully more important, areas.
- Spokesmen for the Environmental Research Division indicated that:
  - the Division is interested in any research that involves the natural revegetation process, recovery of the hydrologic system, and evaluation of the impacts of mining and reclamation on aquatic systems.
  - to study the processes that are involved with various ecosystems, the Division has developed a set of models, such as the 4-A model (which predicts the succession of natural revegetation in southern Appalachia), that have proven to be versatile and surprisingly accurate.
- Spokesmen for the Health and Safety division indicated that:
  - the Division is investigating injuries and property damages that may be due to vehicles and/or road conditions that are associated with mining activities.

  - the major mine-related causes of injuries and property damage are blasting and floods.
  - a study done by L. Robert Kimball and Associates for the Nashville District, Army Corps of Engineers (Final Report, New River Comprehensive Study, Phase II (April 1979)), might be relevant.

Summary of Meetings with Citizens and Environmental Groups

- Members of the study team met with the representatives of two citizens/environmental groups, Save Our Cumberland Mountains (SOCUM), and Tennessee Citizens for Wilderness Planning (TCFWP). Photographic slides of mine-related damage, provided by SOCUM, were shown during the meeting.
- The view was expressed that the major deficiency with reclamation regulation lies with enforcement and not the regulations *per se*. Stricter enforcement was advocated to correct this deficiency.
- Emphasized throughout the meeting were the human costs that are imposed by mine-related damage. Concern was expressed over the continued existence and occurrence of such damage, and over the failure of government agencies to commit sufficient resources to significantly correct this situation.

Summary of Meetings with Mine Operators and Mine Operator Associations

- Members of the study team met with a number of surface and underground coal mining operators, and with a mine operator association, Facts About Coal in Tennessee (FACT).
- Much uncertainty exists among mine operators concerning permitting requirements under SMCRA's permanent regulations. Uncertainty was also expressed over the types of data that will be acceptable for environmental studies that are required to support permit applications.
- From the personal experiences of many mine operators, zero highwall with allowance for a bench (as was permitted under previous Tennessee law) is more effective in controlling sediment runoff than is SMCRA's requirement for return to approximate original contour.
- The need to transfer equipment from production to reclamation activities results in significant lost production and higher costs for many small mining operations.
- Small surface mining operations, e.g., 20- to 100-acre mine sites, are in existence for fairly short periods of time. The view was expressed that the planning activities contained in SMCRA's permitting requirements will have less benefit for small operations than for larger, longer-duration projects. It was felt that the permitting process should take this into account.

- In analyzing the costs of complying with SMCRA, account should be taken of the lowered mining efficiency that will occur in the future recovery of resources from mine sites that have been reclaimed under the approximate original contour (AOC) requirements of SMCRA. More specifically, if future coal market conditions make renewed mine operations desirable at closed mine sites, reopening sites reclaimed under AOC requirements will require more effort than would be needed if other reclamation techniques had been employed.

- Many mine operators, especially smaller ones, lack the professional backgrounds and recordkeeping systems necessary to comply readily with SMCRA's administrative requirements, e.g., permit applications. Compliance by such operators is only possible at a very high cost.

- OSM is exercising neither the professional judgment nor the enforcement flexibility that would permit many mine operations to comply with SMCRA at a reasonable level of effort.

- Under current coal market conditions, the increased operating costs (some attributed to SMCRA) experienced by mine operators will result in a declining number of coal producers.

Summary of Visits to the Tennessee Valley Authority (TVA) and Selected Mine Sites

- With the passage of SMCRA and the establishment of OSM, TVA's involvement in mine land reclamation has virtually ceased. TVA noted that this experience is generally true of a number of public agencies that had previously engaged in reclamation-related activities; it is felt that most of the responsibility and appropriations for this purpose are now channelled through OSM.

- Spokesmen for TVA expressed an interest in participating in efforts to prepare a master plan for future reclamation research.

- It was emphasized that enforcement activities must be prioritized—high damage aspects of mining dealt with first—since benefits from SMCRA depend on adequate enforcement. Flexibility must be allowed between regions and sites, inasmuch as the mining-induced problems and the priority criteria for enforcement will differ for each. This flexibility will provide for the most efficient allocation of limited resources.

- TVA provided tours of two representative surface mines in the Norris, Tennessee area. One of these sites was the Massengale Mountain project sponsored by TVA to study back-to-contour reclamation under steep slope conditions; a description of the Project appears in Appendix 5. The other site is a currently operating mountaintop removal operation that is also conducted under steep slope conditions.

- While at Massengale Mountain, TVA representatives compared the reclamation techniques employed at the site with both earlier reclamation techniques, and those required under SMCRA. It was noted that certain project features, e.g., remaining benches and highwalls, would not be permitted under the current regulations.

- During the study team's visit to the mountaintop removal site, spokesmen for the mine operator explained both the ongoing mine operaton and the reclamation techniques that are being employed. Special note was taken, both by the spokesmen and the TVA escort, of facets of the operation that are related to SMCRA.

- An OSM inspector accompanied the study team to both sites. In addition to commenting on the operations observed, he compared these sites and their activities with other mines in the region.

Summary of Meetings with Regulatory Agency Staffs

- Members of the study team met with representatives of the Tennessee Department of Water Quality, and the Office of Surface Mining, U.S. Department of the Interior (i.e., OSM, Region II).

- Agency representatives noted that SMCRA requires a "rethinking" of surface mining operations. The Act and its regulations call for an essentially new method of operation in surface mining activities.

- Regulatory efforts to reclaim mined areas in accordance with a selected post-mining land use have stressed determining if the planned use is legitimate. Determination of this legitimacy must consider both the current and future needs of the land owner and the affected area; the problems associated with making such determinations in the face of inevitable uncertainty must be recognized.

- Analyses of the effectiveness of SMCRA and its regulations should consider all possible reclamation alternatives that are allowed by the Act.

- Analyses of benefits due to SMCRA should consider the benefit that results from the elimination of uncontrolled dumping of spoils on the mine site's outslope (i.e. "shoot and shove").

- The design standards incorporated in SMCRA's regulations, such as those for sediment ponds, are often necessary in regions with a large number of small operators who sometimes have limited access to engineering expertise. If design standards were not given, many required facilities (such as sedimentation ponds) would be built which would be unsuitable for an area's hydrologic, geologic, and climatological conditions.

TRIP SUMMARY, MONTANA AND ARGONNE NATIONAL LABORATORY

The field visit to Montana involved contacts with mine operators, citizens and environmental groups, and government agencies. The visit was organized and conducted in conjunction with the Montana Department of State Lands, the regulatory agency responsible for the monitoring of surface coal mining operations in the state. Accompanied by a representative from the Department, the study team visited three surface mining operations in Montana during the period May 12-15, 1980. Also present on some of these visits were representatives from the Soil Conservation Service (SCS) and the Northern Plains Resource Council (an environmental group). In addition, the study team had separate meetings with the Northern Plains and Powder River Resource Councils, and with representatives of the Montana State University's Agriculture Experiment Station.

Summary of Mine Site Visits

- Montana's experience with strict surface mining regulations has been more extensive and of longer duration than that of many other states. Montana passed a surface mining law in 1972 and, for the most part, this law was nearly as strict as the present state program which was promulgated to meet the requirements of SMCRA's permanent regulations. The benefits of strict regulations should, therefore, be more apparent in a state such as Montana. In addition, some of the environmental benefits in Montana will result not from SMCRA, but from the development of viable and successful techniques for reclamation.

- The strict State law and subsequent SMCRA legislation has resulted, in Montana, in the establishment of comprehensive mine planning and reclamation processes. Operations are planned and detailed prior to mine development, and a review is conducted of possible environmental consequences. Planning takes place on a long-term basis, often covering the life of the mine. Mines have developed staffs and techniques to handle many reclamation tasks and problems, and extensive research is being undertaken, on-site, to deal with the unanswered questions of reclamation in this area. Thus it would appear that due to strict state, and federal regulations, a benefit in the form of increased operations planning and industry professionalism has taken place in Montana.

- The environmental benefits desired from reclamation in Montana reflect needs and concerns that are specific to the region and its land uses. The primary desired benefits include maintained range land and other agricultural productivity, restored ground water flows, accessible and usable surface water, and topography suited to agricultural usage, wildlife, and recreation. Successful reclamation in Montana will require the use of specific methods tailored to the dry range ecosystem of the coal mining areas.

- Haphazard private and public leasing policies have led to difficulties in achieving some of the benefits desired from SMCRA and the previous state regulations. Mines with leasing problems often have their operations broken into small parcels, with new areas acquired as the operation progresses. In these cases, the full environmental consequences of an operation cannot always be analyzed prior to development, and reclamation cannot always be efficiently planned. In some cases, the absence of a lease, for areas within a mine or adjacent to it, has affected the level of reclamation; mining has progressed in an uneven, checkerboard manner with the general slope, drainage, and topography of reclaimed areas being broken or disrupted.

- An examination was made of mine sites regulated and reclaimed under a variety of methods. The following were some of the findings reported to the study team:

  - areas revegetated with directly placed topsoil showed a more diverse composition of species, and a larger proportion of native species, than did areas revegetated with stored topsoil. In some cases, areas revegetated with stored topsoil appeared no more successful than areas with no topsoil.

  - in many cases, vegetation in reclaimed areas was comparable to that in native range areas. In addition, preliminary results showed acceptable levels of grazing capacities for reclaimed areas. However, benefits in the reclaimed areas often resulted from the high initial productivity of introduced species and from intensive management; neither the high initial productivity nor the intensive management will persist in the long-term.

  - success in establishing vegetation on graded areas is highly dependent on moisture and irrigation in the first season. Areas seeded and then exposed to lengthy dry periods were generally revegetated unsuccessfully, and left the regraded area susceptible to erosion.

  - return of organic matter through burning or grazing has brought on more successful vegetation on reclaimed areas than has cropping.

  - requirements for the reduction of highwalls often conflict with the interests of various post-mining land uses. Sloped areas resulting from the requirements often have less utility for agricultural use than flatlands with vertical highwalls. It was suggested that if a highwall meets aesthetic requirements and its stability can be insured, such as is sometimes the case with a rock highwall or an extension of a rock bluff, then the highwall should be allowed if it better serves post-mining agricultural needs.

- Several trade-offs between benefits ~~are encountered~~ were reported both in the implementation of sections of the regulations, and in the use of different methods of reclamation. The following controversies were ~~noted.~~ reported:
  - the strict enforcement requirements for approximate original contour (AOC) versus more flexible standards. A tradeoff was repeatedly noted between strict AOC grading, which provides, for example, improved aesthetics, and more flexible grading resulting in flatter terrain, which provides better erosion control and greater potential for agriculture. The tradeoff was noted as especially important because, in this area, slope (along with soil type) is a primary determinant of the amount of erosion that occurs. It was also suggested that the option of leaving the final pit open, and having it serve as a water pond for livestock, should be allowed more often than is now the case under current regulations.
  - the need to use introduced species to initially stabilize the soil surface and achieve erosion control, versus the requirement to have diverse native cover to attain a final bond release. It was said that the operators' initial protection of soils from erosion through use of introduced species may, in the long term, make it difficult for them to restore native cover and thus gain bond release.
  - requirements for concurrent reclamation versus the protection of reclaimed areas from future subsidence. It was noted that concurrent regrading of spoil does not always allow enough time for the spoil to settle; this can lead to future subsidence problems in reclaimed areas.

Summary of Discussions with Representatives of Montana State University's Agriculture Experiment Station

The Montana State University Agriculture Experiment Station has undertaken extensive research on the reclamation of strip-mined lands in Montana. At various sites throughout Montana, the Station is currently examining topics such as reclamation techniques, characteristics of vegetation on spoils, hydrology, and others. During our discussions, the following points were made by representatives of the Station:

- The drought-wet period cycle is a major factor that must be taken into account when evaluating the success of revegetation on mined areas. A long time frame is necessary to analyze the ability of revegetated areas to cope with large variations in annual precipitation. Research done to date has found that native rangeland is more stable in drought years, and revegetated mined land more productive in wet ones.

- Fifty-year old, naturally revegetated spoils demonstrate the ability of nature to heal past damage. According to the researchers, the naturally revegetated areas now have a diverse cover of native species, except for spoil banks which were steep enough to still be subject to erosion. (This, incidentally, is a good indication of the substantial long-term benefit of grading for erosion control; although nature may restore a diverse native cover on its own, it may not be able to stop erosion.)

- Many of Montana's increases in reclamation benefits to date would have come about with changes in the state-of-the-art of reclamation techniques, regardless of Federal law. Many future environmental benefits resulting from reclamation will also be attributable to changes in the state-of-the-art, not to regulations.

Summary of Meetings with Northern Plains and Powder River Resources Councils

The Northern Plains and Powder River Resources Councils are organizations consisting of ranchers and farmers who are interested in conserving and protecting the environment in Montana, and in the Powder River Basin in Wyoming. Discussions with representatives of these groups were held in their offices and during site visits to mining operations. The following points were made by the representatives:

- Monitoring arrangements for tracing the environmental impacts of a mining operation, as required by SMCRA, will be useful only when they are properly formulated and located. The Councils questioned the use of on-site monitoring data without prior analysis of the placement of monitoring equipment and of the methods of measurement used.

- It is questionable whether the requirement to return land to approximate original contour is actually achieving the intended level of benefits. The suggestion was made that OSM consider the regulation on a more site-specific basis, and also in terms of the intended (or best) post-mining land use.

- A reclamation plan should be examined with greater emphasis on the desired end-results of the reclamation activity. For example, if the post-mining use of a reclaimed area is cattle grazing, plant species used in revegetation should be chosen on the basis of their usefulness as cattle forage.

- Some of the environmental benefits desired from surface mine reclamation in the West cannot be achieved through simple implementation of the present regulations. Given the present level of research, technology, and length of experience, several questions about reclamation remain unanswered. These questions include:

    - the ability to establish long-term, drought-tolerant, plant communities in revegetated areas

- the relative long-term success of introduced species in the range environment, and the ability of native species to compete with aggressive introduced species
- the ability to restore ground water flows in mined areas to their pre-mining levels (in some areas, preliminary evidence indicates that this can be done)
- the ability to maintain the long-term productivity of mined areas, especially after the termination of intensive management by mine operators.

Summary of Meeting at Argonne National Laboratory Concerning the Land Reclamation Program

A meeting was held with representatives of the Argonne National Laboratory's Land Reclamation Program (ANL-LRP) on May 15, 1980, in Argonne, Illinois. The discussions dealt with mined land reclamation in general, various reclamation techniques, and the specific work that the Land Reclamation Program has done to assess the environmental impacts of surface coal mining and SMCRA. Argonne has conducted major research projects on land reclamation, primarily in the Midwestern and Western coal mining regions of the United States; these projects were detailed and their relevance to this OSM project was discussed. Argonne representatives also presented their evaluation of future research that is needed to analyze the benefits of SMCRA, and the effects of surface mining and reclamation in general. The following points were made by the Argonne representatives:

- The Argonne Land Reclamation Program is working on a ten-year plan for multi-disciplinary research of mined land reclamation. The funding for this effort is provided primarily by the U.S. Department of Energy and the State of Illinois, and interagency agreements exist with agencies such as OSM, the Bureau of Mines, EPA, and the Fish and Wildlife Service. Research is currently being conducted at ten sites in Wyoming, New Mexico, Arizona, Alabama, and Illinois.
- The Land Reclamation Program is currently developing a Surface Mining and Land Reclamation Information System (SUMLRIS). The system collects and computerizes data (such as permitting information) from the paper files of State agencies which regulate surface mining.
- One project in Illinois is currently examining the impacts of implementing the prime farmland requirements of SMCRA and its associated regulations. The project is analyzing both the productivity of reclaimed areas and the costs of performing the prime farmland reclamation. An evaluation is being conducted of pre- and post-SMCRA prime farmland reclamation, and of alternative methods for handling these areas.

- The Land Reclamation Program is also examining the effectiveness of different reclamation techniques, and the benefits that are associated with them. Areas currently being examined include: selective placement of overburden, immediate reapplication of topsoil; and the effectiveness of irrigation at Western mines.

- The experience of the Argonne representatives with SMCRA and its associated regulations has led to the formation of specific views and suggestions concerning the Act, the regulations, and the benefits resulting from their implementation. The following are some of the major views of the individuals we spoke with:

  - regulations for return to approximate original contour should be adapted to each area of the country where they are being implemented. For example, it was indicated that at some Eastern sites, return to approximate original contour can often do more harm than good; it can allow erosion, increase the sediment load of neighboring waterways, and eliminate the possibility of using flatland (which is at a premium) for agriculture.

  - effluent limitations required of mines should be addressed on a more site-specific basis. In the West, for example, even waters in unmined areas cannot always meet the OSM standards; the level of total suspended particles (TSP) in these waters is already above that allowed by OSM.

  - removal and replacement of topsoil is not achieving the desired benefits in some areas of the country. In parts of the East, removal and replacement of thin topsoil represents wasted effort since there is little resulting benefit for revegetation. In parts of the West, stockpiling of topsoil often diminishes its quality; immediate reapplication of topsoil should be allowed and may even serve as an alternative to irrigation. In some cases, reconstructing topsoil exactly to its original A, B, and C layers (especially the latter two layers) does not—according to soil scientists—always yield the highest productivity. Although the burden of proof should be on the operator, the option for a variance in the reconstruction of soils should be readily accessible.

  - although the assumption is made that SMCRA requirements will provide benefits, this is not necessarily the case. A detailed technical analysis is required for specific requirements of the Act and their associated regulations.

- A comprehensive assessment of the benefits of SMCRA will require a long-term research effort, the development of specialized monitoring installations at mine sites, and the analysis of specific aspects of the regulations and of reclamation. The following areas were suggested for research:

  - alternatives to return to approximate original contour, such as valley fill and mountaintop removal. The impacts of the requirements for return to original contour should be analyzed more carefully, especially in the East.

  - prime farmland requirements, with emphasis on topsoil regulations. In the view of the representatives, the time frame for proper evaluation of these requirements is about six years.

  - alluvial valley provisions. These should be analyzed in terms of the costs of compliance and their resulting benefits.

- A proper analysis of the benefits, costs, and effectiveness of SMCRA's regulations will require a ten-year study at operating mines.

- Other government agencies, Federal and state, assume that OSM has now taken the lead in research into surface mining reclamation. As a result, some have curtailed their own funding levels for surface mining research.

- The mineral research institutes established by SMCRA fund research not only for coal, but also other minerals, and the emphasis of these institutes seems to be on mining, not reclamation. In addition, the funding is provided to universities, and the research undertaken by these universities may reflect local needs, and not necessarily those of the entire nation.

APPENDIX 5

Description of the Massengale Mountain Back-to-Contour Reclamation Project

176.

SURFACE MINING COAL ON STEEP SLOPES: BACK-TO-CONTOUR DEMONSTRATION

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Introduction

At the outset of World War II, less than 10 percent of the nation's coal was produced by surface mining. Since that time, significant advances in earth-moving capability together with changing coal markets (principally steam electric generation) have greatly stimulated use of this method. Today, surface mining accounts for a little more than half the nation's total production. The ratio of surface to deep mine coal is projected to increase even more as the nation's coal industry strives to push annual production to the billion ton level by the mid-1980's.

Unfortunately, the early acceleration of coal surface mining was largely uncontrolled and too often environmentally reckless. The 1967 national report, "Surface Mining and Our Environment" (USDI 1967), clearly documents this advancing environmental-energy dilemma.

With the coming of the environmental awareness of the early 1960's, it was not surprising that the surface mine problems, compounded by years of national neglect, would become one of the front line environmental issues. Nor was it surprising that the Appalachian coal field, particularly the mountainous and highly visible central region, was singled out for special attention. Contour mining on precipitous terrain became a major concern. The highwalls, benches, and outslopes resulting from the "drill, shoot, and shove" mining method of that early era became the center of hot public debates.

It was in this setting a dozen years ago that the problems of steep slope mining techniques were first targeted for special attention. The challenge was to test and develop new mining methods which would meet the tougher environmental standards, an awakening concerned public would demand.

In the mid-1960's the reclamation arms of Kentucky and West Virginia, working with other state and Federal agencies and the coal industry, began the first serious efforts to improve surface mining techniques in central Appalachia. Engineering principles guiding earth movement and placement were adapted to mountain mining conditions. New terms such as "bench width restrictions," "head-of-hollow fill," "scalping," and "box-cuts" were quickly added to the mountain miner's vocabulary. The major thrust of these early efforts was to keep overburden closer to its original placement. It was predictable that support for complete backfilling to approximate original contour on steep slopes would follow. Advocates began to argue this case seriously about 1970.

The Tennessee Valley Authority has had a long-term interest and concern for the problems of coal surface mining. Through the years the Agency has undertaken extensive efforts to help find better and more effective mining and reclamation techniques. Since 1965 TVA has had the unique opportunity to test developing technologies through its work with suppliers complying with reclamation provisions included in coal purchase contracts.

As part of the Agency's contribution, in 1971 the TVA Board of Directors gave its staff the assignment of undertaking the first large scale, carefully documented test of "back-to-contour" mining on steep slopes (using revenue from power sales).

(Reprinted from Papers Presented Before The Fifth Symposium on Surface Mining and Reclamation. NCA/BCR Coal Conference and Expo IV, Louisville, KY, Oct. 18-20, 1977 Washington, DC: National Coal Association. 1977. 319 pp.)

The objective was to determine costs, to assess potential impact, and to help eliminate uncertainties over this developing mining technique. The Board directed that detailed records be kept and the findings published for the benefit of all interested parties.

TVA engineers and reclamation specialists assigned this task selected a test site on the south side of Massengale Mountain in Campbell County, Tennessee, where the Agency owns the coal reserves. Typical of the rugged southern Appalachians, Massengale Mountain shows topographic relief from 1,410 to 3,250 feet above sea level. A test site almost three miles long was selected between contour 2,460 and 2,560, where four minable seams outcropped (Figure 1). Total thickness of the four seams averaged about 10 feet. Along the demonstration site, slopes varied from 21 to 36 degrees, averaging 25 degrees. The overburden was sandstone and gray shale, typical for the region.

A difficult job at the outset was to anticipate how steep slope original contour provisions in future regulatory laws would be interpreted. TVA felt that the configuration selected for the Massengale demonstration (Figure 2) would be reasonably close. With the exception of using 20 feet of vertical slope distance below the lowest seam to place a portion of the excess overburden (a 25 percent overburden expansion was experienced at Massengale), the final configuration is probably close to what will be required under the recently enacted Federal surface mine control law.

To assure that careful cost records were kept, TVA contracted with the Long Pit Mining Company, Harriman, Tennessee, to do the mining on a cost plus fixed fee contract. (Under a similar contract, Long Pit was just then completing a conventional surface mining job on the same coal seams on the north slopes of Massengale providing valuable comparative data for measuring the incremental costs of the back-to-contour test.)

TVA and Long Pit engineers felt that truck haulback[1] was the most feasible mining method to apply on the Massengale site. To accomplish this, four 50-ton capacity Caterpillar 773 rear dump trucks[2] and two dozers (one D-9, one D-8) complement the machinery previously used in conventional mining on Massengale Mountain.

The mining plan (Allen 1973, Allen and Long 1974) was to work 3,000-foot sections completing the mining and reclamation on all four seams before moving to the next section. The mining sequence is shown in Figure 3. Initially, a 1,000-foot cut was taken on the Red Ash (Figure 1) beginning where the access road intersected the seam. A limited downslope fill (as previously described) was built and the remaining overburden hauled offsite for permanent placement at selected areas on Long Pit's former mining operation. While the stripped coal was being removed and the coal face augered at the beginning cut, overburden removal began on the remaining 2,000 feet of the first mine section. The initial spoil was hauled offsite. When augering was completed on the first 1,000-foot cut, offsite haulage from the 2,000-foot cut ceased, and backfilling of the first pit began using lateral truck hauls. When the highwall was eliminated, the fill was reduced to a 1-1/2:1 slope. The outer 30 feet of the mine bench was kept clear of spoil to provide a roadway and to help control surface runoff. Revegetation efforts began as soon as spoil was in final placement.

When stripping was completed on the first 3,000-foot section of the Red Ash, mining began on the Pee Wee-Walnut Mountain seams some 55 feet higher on the slope. To the maximum extent possible, spoil from this cut was pushed into the lower pit with excess hauled offsite to permanent disposal areas. Mining then moved to the

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[1] To help establish the validity of this decision, a small "Pennsylvania block cut" test was later conducted simultaneously on a site adjacent to the truck haulback demonstration.

[2] Mention of trade names does not imply endorsement by TVA.

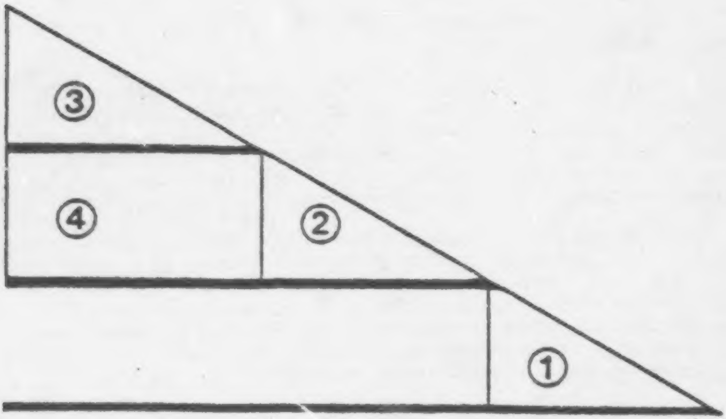

Figure 3. Stripping sequence.

highest seam where a 40-foot highwall was made. Approximately half the spoil was pushed into the Pee Wee-Walnut Mountain seam, and the balance was hauled offsite.

The second cut on the Pee Wee-Walnut Mountain was then taken and pit backfilling began using lateral overburden hauls. The Rider seam augering was not done until backfilling reached the coal level. After augering, the highwall was backfilled, completing mining of all four seams in the initial 3,000-foot section (Figure 4). This sequence was repeated on additional 3,000-foot sections until 2.6 miles of outcrop were mined, completing the demonstration.

The Massengale Report

Mining at the Massengale site began in July 1972. By July 1975, 878,000 tons of coal were mined with an average overburden to coal ratio of 9.79:1. Trucks handled 72 percent, with the balance moved to final placement with dozers and front-end loaders as in conventional mining.

By early 1975, because of the pressing need that decision-makers and others had for reliable facts on steep slope, back-to-contour mining, TVA decided that sufficient data had been collected to permit a reliable appraisal of the experience. To assure objectivity and provide this information at an early date for legislators, industry representatives, and others, TVA contracted with The University of Tennessee to do the analysis and report. The varied and competent expertise of the University's Environment Center was brought to the task. Given free access to all the detailed information collected, the university published a final report on December 15, 1976 (Bohm et al. 1976).

This report looks closely at increased costs associated with back-to-contour mining using several different approaches. What is shown most clearly by the analysis is that incremental mining costs over conventional mining systems revolve largely around the overburden handled by truck. The report also deals with the questions of potential production loss, equipment and financial constraints, regional production shifts, and resource recovery aspects.

Conclusions reached by the authors of The University of Tennessee report on the Massengale demonstration are:

> THE INCREMENTAL PRODUCTION COST OF BACK-TO-CONTOUR MINING OVER CONVENTIONAL MINING IS APPROXIMATELY $2.67/TON IN 1973 DOLLARS. The range of estimates of the incremental cost is from $2.40 to $2.93 per ton. These estimates represent the increased cost over a level of reclamation representative of that required by many state surface mine laws under steep slope conditions.
>
> THE TRUCK-HAUL-BACK TECHNOLOGY EMPLOYED AT MASSENGALE IS AN EFFICIENT BACK-TO-CONTOUR TECHNIQUE FOR STEEP SLOPE SURFACE COAL MINES IN CENTRAL APPALACHIA. The Pennsylvania Block Cut method has no clear cut economic advantage over the truck-haul-back technique for steep slope Central Appalachian mines. In addition, truck-haul-back appears much better suited than Pennsylvania Block Cut to the geologic, geographic access conditions encountered in this region.
>
> WITH A SUFFICIENT INCREASE IN CAPITAL, PRODUCTION LOSSES CAN BE AVOIDED. Two independent estimates placed the potential production loss at Massengale between 10.0% and 15.0%. However, for back-to-contour mining the capital/output ratio was increased by 31.6% over conventional mining and as a result the actual production loss at Massengale was approximately zero.
>
> BACK-TO-CONTOUR RECLAMATION WILL GREATLY INCREASE THE DEMAND FOR LARGE TRUCKS AND DOZERS. Wide application of the Massengale back-to-contour technique will result in the demand for large off-the-road trucks greatly exceeding existing production capacity. The ability of the mining industry to obtain a sufficient number of these trucks will largely determine the extent of short-run production declines in Central Appalachia as a result of back-to-contour reclamation requirements. Although the need for additional dozers will be significant, recent studies suggest sufficient industry capacity to meet this demand.
>
> FINANCING NEW EQUIPMENT NECESSARY FOR BACK-TO-CONTOUR RECLAMATION MAY BE DIFFICULT FOR SMALL MINERS. The cost of new equipment necessary to perform back-to-contour reclamation will be high relative to the total assets of small mines. Uncertainty with respect to the future of coal will both reduce the desires of small miners to undertake large financial obligations and increase lender resistance.
>
> BACK-TO-CONTOUR RECLAMATION REQUIREMENTS WILL HAVE LITTLE EFFECT ON TOTAL PRODUCTION IN CENTRAL APPALACHIA. The estimated change in production is a 4.8% decline in surface production and 6.8% increase in underground production. The small decline in surface production results from the relative superiority of Central Appalachian coal in terms of sulfur content over coal from other eastern coal producing regions.
>
> RETAINING BENCH WIDTH LIMITATIONS IN CONJUNCTION WITH BACK-TO-CONTOUR RECLAMATION WILL RESULT IN INEFFICIENT RESOURCE RECOVERY AND HIGHER COSTS/TON. The need for bench width limitations is eliminated by back-to-contour reclamation requirements since casting spoil down slope will be prohibited.

Discussion and Comments

The Massengale Mountain experience is a case study of "back-to-contour" mining and, therefore, not precisely transferable to other steep slope mining situations. However, the findings can be valuable to those in the mining industry shifting to truck haulback on steep slopes to comply with requirements of the new Federal surface mine law.

Added mining costs are of primary interest. Before the demonstration got underway, TVA engineers estimated that the total incremental costs of the "back-to-contour" test would prove to be very close to the overburden trucking costs. At Massengale seven cubic yards were trucked per ton of coal mined. Multiplying by the 1973 trucking cost of 40 cents per cubic yard, we come very close to the actual incremental cost experienced. For 1977 calculations, a cost of 55 cents per cubic yard would be used for sites similar to Massengale.

To the coal miner, production loss is critical. The mining industry and those they supply are understandably concerned about the impact of back-to-contour mining requirements on production. Much of the debate in recent years over Federal controls centered on losses that are bound to occur in surface production in the process of restoring steep land to original contour.

To maintain the production levels possible under conventional mining systems, Long Pit Mining Company increased capital 54 percent and labor 34 percent. Output per man day fell from 25.4 tons with conventional systems to 21.6 tons on the demonstration site. Production losses as a result of back-to-contour mining in steep terrain will be avoided only if sufficient capital and labor are added.

Surface mine coal recovery was greatly increased on the "back-to-contour" demonstration. Per unit of outcrop, coal recovery was almost doubled compared with that of comparable conventional mining. This was possible because no restrictions were placed on the width of cuts as they were on the conventional site. Mine benches were as wide as 210 feet on the demonstration compared to a maximum 80 feet on the conventional mine site.

In "back-to-contour" mining, coal recovery should be maximized and the operation should be planned to preclude remining. Wherever possible, however, opportunities for future underground mines should be provided as they were at three points on the Massengale slopes. This is further justification for the permanent type road network left on the demonstration site.

Because of time constraints and past mining impacts in the demonstration watershed, TVA did not have the opportunity to collect detailed data on the environmental impacts of the "back-to-contour" system. TVA realizes that data on the comparative environmental impacts of different mountain surface mining systems are needed. The Agency has been planning such a cooperative study with the U.S. Departments of the Interior and Agriculture but the work has unfortunately been delayed due to the difficulty of finding suitable study watersheds.

Some environmental data, however, were collected at Massengale. The U.S. Forest Service's surface mine research team, under a TVA contract, measured soil movement at selected points along a portion of the steep backfills. Measurements taken over a 20-month span show that erosion of study plots occurred at the rate of 113 tons per acre per year (no determination was made, however, of the amount actually leaving the site). The evaluation began during a period of no vegetation through the advanced establishment of grass and legume cover.

At Massengale, onsite land disturbance for a given length of outcrop was one-third less than conventional mining. However, it must be noted that excess overburden (because of the 25 percent "swell" factor) required considerable offsite storage. At Massengale, this material was put on old mine sites nearby. In many cases, undisturbed land will have to be used.

CHAPTER VI

FINDINGS AND CONCLUSIONS

VI. FINDINGS AND CONCLUSIONS

INTRODUCTION

The findings and conclusions of the benefits study are divided into the following categories:

- Availability of Information for Assessments of Benefits and Other Impacts of SMCRA
- Characteristics of Available Information
- Reported Technical Impacts of Current Mining and Reclamation Operations
- Perceptions of SMCRA/OSM and General Implications of SMCRA Enforcement
- Directions of Current and Future SMCRA-Related Research.

In the remainder of this chapter, we discuss the findings in each category in more detail.

AVAILABILITY OF INFORMATION FOR ASSESSMENTS OF BENEFITS AND OTHER IMPACTS OF SMCRA

- Data from national-level sources (e.g. the U.S. Department of Agriculture) is frequently presented for individual states and the entire nation. The data is usually available through the year 1979 and often into the current year, 1980. The data is the most recent available and often includes time series information for both pre- and post-SMCRA operating environments. However, since analyses related to SMCRA must often address issues at a site-specific or local (e.g. county) level, this data is of limited use unless, for specific data elements, experience across a state is fairly homogeneous. Thus, in a particular state, prices received by farmers for a certain crop may vary little from county to county; in such a case, state-level data may be used as a proxy for county-level data with little loss of analytical accuracy.

- National-level data sources provide a limited amount of data at the local level. Two noteworthy examples are the Census Bureau's 1978 Census of Agriculture, which provides comprehensive agricultural data at the county level, and the Bureau's annual Housing Units Authorized by Building Permits and Public Contracts, which provides data on building permits issued at the county and sub-county (e.g. city) levels. However, the most recent year for which this data was found is 1978. Thus the local data that is provided by national-level sources is mostly dated, and, in addition, offers a maximum of one year's experience with post-SMCRA operating conditions. (This one year's information applies to the time when the Act was being initially implemented.)

- The most frequently found local-level data is for counties within a reporting state. Much of this county-level data is only available from county or state sources. As an example, the Crop Reporting Boards of the various states publish annual Agricultural Statistics for their states; these reports contain a wide range of county-level agricultural data. The most recent data found from these sources was for 1978.

- In reviewing the published results of past and current studies, extensive efforts were made to identify the relevant universe of the literature. While many of the existing reports have been identified, there is reason to suspect that additional material exists from as yet unidentified sources. As an example, relatively few studies were found or reviewed for the Midwest study region. During the final stages of the benefits investigation, it was found, in the course of other inquiries, that the Coal Extraction and Utilization Research Center at Southern Illinois University has been very active in the mined land reclamation field in the Midwest. This group's existence raises the question of how many other groups, who are engaged in significant research, are not readily identifiable from standard reference sources (e.g. published reports and bibliographies).

- Research efforts in the surface mining and reclamation fields are being conducted by many groups across the nation. Based on communications with a number of these groups, it appears that there is little awareness by research groups of related research that may be conducted by those beyond the group's usual working contacts. This lack of awareness makes identification of research groups working in the surface mining and reclamation areas very difficult, especially if this identification is to be accomplished on the basis of references in known studies or conversations with known researchers.

- In the course of communications with public agencies who are involved, to varying degrees, with different aspects of surface mining and reclamation, it became clear that personnel in an agency's headquarters are not always well informed about their agency's activities in the field. As an example, a spokesman for one agency indicated that his agency was concerned with neither mined land reclamation nor its related research; subsequent investigations revealed that a research center for that agency has indeed been involved in such research. The ability to ascertain an agency's knowledge of research activity is, therefore, a function of the knowledge, or willingness to cooperate, of the agency spokesmen contacted.

- Incomplete awareness of activities in the surface mining and reclamation research fields, by either affected public agencies or interested research groups, makes identification and evaluation of all significant research a time-consuming activity. Two of the research groups contacted in this study reported that they are in the process of identifying past research in the reclamation field. In conversations with the study team, they indicated that they had encountered difficulties similar to ours in their efforts; other research groups expressed no surprise at this finding.

- The availability of data across benefit and other impact areas is not uniform. In some areas, like agriculture, extensive data at the county, state, and national levels is available. In other areas, like the destruction of fragile or historic lands, virtually no data of any type exists. For many benefit/impact areas, partial data exists; the American Red Cross, for example, can provide considerable data at the local level on damage to residential property, but less data for damage to commercial property.

- Local level or site-specific data will probably be available from two principal sources:
  - county or sub-county (e.g., city) agencies in the study region
  - data collection by the study team in and around the study site.

This finding is based on both the current review of existing data bases and on the past experience of researchers active in the surface mining and land reclamation fields. (The past experience of researchers was learned about from published reports and from personal conversations.) In some cases, local or site-specific data may also be found from county-level studies that use such data.

- At least one major data base of potential assessment value is a manual, geographically dispersed information system: the National Pollutant Discharge Elimination System (NPDES) of the U.S. Environmental Protection Agency. The dispersed and manual nature of such a system makes it difficult to access and manipulate, except on a site-specific basis. Other information systems with similar accessing characteristics are the systems of court records that could contain information relating to legal claims for property damage and personal injury; these systems may be useful in evaluating the social costs of mining in impacted areas.

CHARACTERISTICS OF AVAILABLE INFORMATION

- Research into surface mining and subsequent land reclamation has been most extensively conducted in Appalachia, both with regard to the number of studies conducted and the range of impacts addressed. Of the 66 studies reviewed, 30 related to Appalachia; the West (with 17 studies) and the Midwest (with 5 studies) follow in that order.

- In descending order of occurrence, the most frequently addressed areas of impact are those relating to:
  - Water
  - Land and its productivity
  - Fish, wildlife, and their habitats
  - Aesthetics
  - Mining operations
  - Recreation.

Additional information on this ranking may be obtained from Exhibit 2.7, Chapter II.

- The number of studies that express mining and reclamation impacts in monetary terms represent but a small fraction of the total number of studies reviewed. By region, 23% of the studies in Appalachia, 20% of the studies in the Midwest, and none of the studies in the West or the South Central regions contain monetary estimates of benefits. Further information on the way benefits and other impacts are handled by the reviewed studies is summarized in Exhibits 2.5 and 2.6, Chapter II.

- Among the reviewed studies that address mining and reclamation at the national level, only 17% address specific benefits or impacts. For the individual study regions, on the other hand, the percentage of studies that address specific benefits or impacts range from 50% (in the South Central region) to 80% (in the Midwest) (see Exhibit 2.6 for details). This data clearly indicates that specific benefits and impacts are much less frequently addressed at the national level of analysis.

- Reviewed studies that contain quantified estimates of the benefits and impacts of surface mining or reclamation are characterized by:

    - the site-specific nature of their study areas
    - the utilization of data collected in the field by members of the study team
    - the limited use of existing data bases in making benefit/impact assessments.

- Based on our review of pertinent studies and on discussions with researchers in the field, it appears that no generally accepted, or prioritized, research goals exist to guide the evaluation of the benefits and impacts of surface mining and reclamation. This lack of goals, together with the virtual absence of coordination among research groups, appears to have resulted in work that either follows the current interest of the researchers involved, or the desires of whatever agency sponsors their work at a given time. As sponsors and their needs change, so does the scope and nature of the work that is undertaken. Research continuity is most difficult under these conditions.

- A number of the reviewed data bases that contain potentially relevant information lack data elements that would allow direct relationships to be established between suspected benefits (or impacts) and mining, reclamation, or other SMCRA-related activities. The disaster data base of the American Red Cross, and the Fatal Accident Reporting System of the National Highway Traffic Safety Administration, are good examples of data bases that contain detailed injury and/or property damage information, but nothing that would permit this information to be directly related to variations in mining and reclamation activities.

- Based on our review of the relevant literature and data bases, and on communications with established researchers in the field, it appears that the body of data needed to make comprehensive and defensible state, regional (multi-state), or national-level assessments of surface mining, land reclamation, or other SMCRA-related topics, does not currently exist. Under these circumstances, such assessments, at present, are impossible. Substantial efforts—in terms of time, costs, and other research resources—are required to fill the data gaps.

- A number of potentially relevant, site-specific data bases report on certain aspects of benefits or impacts but not on others. The National Pollutant Discharge Elimination System (NPDES) of the Environmental Protection Agency, for example, reports on point source discharges of polluted water from a mine (i.e., water emerging from the mine's waste water system); however, non-point sources, such as runoff from spoil banks, are not reported.

- Virtually all of the reviewed studies and most of the other reviewed research, relates to impacts of surface mining and land reclamation. Other SMCRA-related matters, such as mine permit applications, premine planning, and bonding are seldom addressed. In this regard, it should also be noted that little of the published research deals specifically with SMCRA and that research addressing the Act is only beginning to be documented.

REPORTED TECHNICAL IMPACTS OF CURRENT MINING AND RECLAMATION OPERATIONS

- Based on the review of the literature, it appears that much of the property damage and personal injury attributable to surface mining activities is, at least in Appalachia, water-related, i.e., related to flooding, sedimentation, or siltation. Another cited cause of property damage is mine-related blasting.

- Evidence from several sources suggests that, over a period of years, many types of abandoned mine land will be reclaimed by nature. In view of nature's demonstrated resiliency in restoring such land, it was noted that redisturbing naturally reclaimed land as part of a reclamation program may be counterproductive.

- Examination of older, naturally reclaimed areas suggests that nature can accomplish certain forms of reclamation (such as revegetation) more readily than others (such as erosion control). This finding suggests that OSM may achieve greater returns on its regulatory efforts in certain areas, and that it may be able to afford, because of natural reclamation, to place less emphasis on others.

- A common sentiment among a number of organizations that were contacted by the study team, both in and out of the mining industry, is that unless SMCRA and its regulations are enforced with significant flexibility, attempts at controlling the adverse effects of surface mining with a single set of regulations will meet with limited success. The reason most often given for this view is that mining conditions within a coal region, and between coal regions, are too variable to be equally well governed by one set of inflexibly administered guidelines.

- The value of strict enforcement of approximate original contour (AOC) reclamation was questioned. Grounds for these reservations include:
    - Many benefits of AOC reclamation (e.g., improvement in aesthetics) will not be fully realized except in inhabited areas. In certain coal-producing regions, for example in Appalachia, much of the surface mining is conducted on uninhabited land that is not being productively employed (e.g., used for farming), and is not readily accessible as a scenic area to visitors.
    - Some environmental benefits desired from reclamation, such as erosion control and slope stability, do not appear to be well served by AOC techniques. In the East, it is said that strict enforcement of AOC reclamation can allow erosion, increase the sediment load of neighboring waterways, and eliminate the possibility of creating flatland (which is at a premium) for agriculture. Further research is needed to identify the level of benefits that can be obtained from AOC, as opposed to other, reclamation techniques.
    - A number of researchers have noted that AOC reclamation is often regarded as restoring land to virtually its original condition. While beneficial in a number of respects, this reclamation will not restore such characteristics as original soil compaction; these altered characteristics will affect the land's utility for various applications.

- The value of strict enforcement of SMCRA's topsoil requirements has been questioned. In parts of the East, it is said that removal and replacement of the topsoil would be a wasted effort since it is thin and has little resulting benefit for revegetation. In parts of the West, stockpiling of topsoil is claimed to often diminish its quality; it is said that immediate reapplication of topsoil should be allowed and may even serve as an alternative to irrigation. In some cases, reconstructing topsoil exactly to its original A, B, and C layers (especially the latter two layers) does not—according to soil scientists—yield the highest productivity. Although the burden of proof should be on the operator, it is said that the option for a variance in the reconstruction of soils should be available.

- Some of the contacted groups have maintained that concurrent reclamation is not always for the best. It is claimed that concurrent regrading of spoil does not always allow enough time for the soil to settle; this can lead to future subsidence problems in reclaimed areas.

- It has also been claimed that the effluent limitations required of mines should be addressed on a more site-specific basis. In the West, for example, it is said that even waters in unmined areas cannot always meet the OSM standards; the level of total suspended particles (TSP) in these waters is said to be already above that allowed by OSM.

- The added difficulties and expenses of surface coal mining under SMCRA may produce a trend towards greater production of underground coal, and/or a greater concentration of coal production among a limited number of mine operators. Given its higher operating costs, a trend to underground mining will probably result in higher coal prices for energy consumers. A trend towards reducing the number of coal producers in the industry will increase the degree of monopoly that exists in the coal market and may also result in increased coal prices.

PERCEPTIONS OF SMCRA/OSM AND GENERAL IMPLICATIONS OF SMCRA ENFORCEMENT

- Both mining interests and environmental groups generally agree that SMCRA and its regulations will remain substantially unchanged from their current forms. Mining interests, however, want greater flexibility in OSM's enforcement efforts, at least to the extent that these efforts recognize the impacts that site-induced differences have on mine operations. Environmental groups, on the other hand, regard current regulations as moderate, and want strict enforcement to preclude any weakening of regulatory effectiveness.

- The research community, and non-OSM government agencies (both federal and state) who are concerned with activities related to SMCRA, expect OSM to provide leadership and guidance in Act-related research. A frequently expressed view is that SMCRA has designated OSM to provide such leadership, and that the agency has been granted the necessary authority and budgetary resources for this purpose. Contacts with state agencies suggest that they look to OSM not only for guidance, but also for financial assistance to support their efforts in SMCRA-related research. Under the assumption that OSM has taken the lead in surface mining and reclamation research, some Federal agencies have curtailed their own reclamation research efforts.

- After reviewing the comments of a number of contacted groups both in and out of the mining industry, it appears that there is some confusion over the manner in which OSM interprets and enforces SMCRA and its regulations. While much of this confusion is found among mine operators, uncertainty was also found within the research community concerning both interpretation and enforcement of provisions of the Act and its regulations. Uncertainties over enforcement frequently focused on the issue of flexibility.

- Several sources indicated that both federal and state mine inspectors have exercised flexibility in enforcing certain regulations, in order to gain voluntary compliance by mine operators in other areas. Views on the effectiveness of this strategy differ; some observers feel that minor concessions have been granted in exchange for substantive mine improvements, while others feel that such "horse trading" only weakens regulatory efforts.

- Because of their professional and educational backgrounds and/or their lack of sophisticated multipurpose recordkeeping systems (e.g., accounting systems), many mine operators report that it is extremely difficult and costly to comply with SMCRA's regulations. The views have been expressed that:

- The manner in which the Act and its regulations are written impose technical and educational requirements on the backgrounds of mine operators that many cannot meet. As a result, most of these operators require at least some assistance in comprehending and/or complying with certain of the Act's provisions.
- Information-reporting requirements imposed by SMCRA and its regulations either exceed, or are different from, the kinds of information that most mine operators keep. For many operators, especially smaller ones, efforts to meet these requirements will entail extensive and potentially costly alterations to their recordkeeping systems.

These difficulties and their potential for added costs have implications for both the total cost of mine operations and, especially for smaller operators, the economic feasibility of continuing in operation.

- In parts of Appalachia, wildcatting and noncomplying production on less than two acre mine sites appear to be common practices among a significant portion of the mining community. Estimates of such practices vary, but are in many instances substantial. Since these operations are often unlicensed and virtually uncontrolled, their continued existence, if undiminished, will clearly impair SMCRA's regulatory effectiveness. Also, in high reclamation cost areas like Appalachia, price undercutting by these operators appears to have affected the competitive structure of the coal market.

DIRECTIONS OF CURRENT AND FUTURE SMCRA-RELATED RESEARCH

- The lack of sufficient existing data, and the site-specific nature of many mine-related problems, suggests that future assessments of the benefits of SMCRA must be made on a site-specific basis and in accordance with carefully conceived plans of study. In order to assess the impact of each contributing factor to SMCRA's benefits, it will be necessary to devise study plans that will permit the identification of impacts of other contributing factors. To meet this planning requirement, some form of study control (baseline) must be employed. A number of control strategies that have already been employed are discussed in the report summaries of Appendix 1. (The reports for Appalachia in general, and those prepared by the Energy, Environment, and Resources Center, University of Tennessee, in particular, provide good examples of such control strategies.)

- The assessment of benefits is greatly complicated by the need for baseline data that reflects pre-SMCRA operating conditions; this data often does not exist. Water quality and other hydrological conditions are illustrative of this situation. Unless a study area's hydrological conditions have been systematically monitored prior to implementation of SMCRA, pre-Act data will not exist. Furthermore, monitoring efforts engaged in now will only yield data for the post-Act environment, and may not permit distinctions to be made between variations in hydrology due to SMCRA and those due to other factors.

- The largest non-OSM government group involved in significant mined land reclamation research—the Argonne National Laboratory—is conducting its research independently of OSM. Since Argonne is primarily concerned with reclamation and the technical processes that bring it about, and in any case has responsibilities and goals distinct from those of OSM, this situation is perhaps neither surprising nor avoidable. The potential benefits of mutual cooperation—such as reduced duplication of effort and increased availability of resources for studies of specific interest to OSM—suggest, however, that opportunities for such cooperation should at least be explored.

CHAPTER VII

RECOMMENDATIONS FOR FUTURE SMCRA-RELATED RESEARCH

VII. RECOMMENDATIONS FOR FUTURE SMCRA-RELATED RESEARCH

INTRODUCTION

The purpose of this chapter is to present our recommendations for future SMCRA-related research. These recommendations are presented in the following categories:

- Recommendations for Planning Future Research
- Recommendations for Specific Future Research
- Administrative Recommendations.

In the following pages, we discuss each of these categories in more detail.

RECOMMENDATIONS FOR PLANNING FUTURE RESEARCH

Before comprehensive and defensible assessments of SMCRA can begin, additional work will be required to:

- Develop needed input data; and
- Acquire a fuller understanding of the reclamation processes involved.

This work will be both time-consuming and expensive. Careful and well-conceived plans must be developed to conduct it, and the actual evaluations of SMCRA that will follow.

Research Goals

Evaluations of SMCRA are hindered by a lack of clearly defined research goals. As the Federal agency with primary responsibility in this field, OSM should formulate a well-defined, and sufficiently specific, set of goals to guide future efforts. We recommend that OSM:

- Establish its own information needs, which will be determined by its operating environment and the requirements imposed on it by SMCRA.
- Develop a set of research goals that will accommodate these needs.
- Convene a study committee of representatives of government agencies and research groups who are known to be involved in activities relating to SMCRA. This committee will be able to provide useful insights into existing research on surface mining, land reclamation, and other areas relevant to SMCRA.

- Identify, in conjunction with other committee members, information needs that potentially arise from:
    - other government agencies, both Federal and state
    - the Administration and/or Congress
    - interested segments of the public and the research community.
- Develop, based on the findings of the committee, goals that address information needs external to OSM, and revise, if appropriate, the research goals that address information needs internal to OSM.
- Classify research goals into short- and long-term categories. Short-term goals provide guidance to efforts such as quick-response studies and administrative support activities. Long-term goals provide guidance to efforts that address substantive issues, and that may require significant amounts of time and effort.
- Establish, within both short-term and long-term categories, priorities for the various goals. These priorities will reflect the urgency of the internal and external information needs that are established by OSM and its study committee.

Recommended Research and Required Study Resources

Once short- and long-term research goals are established and prioritized, it is recommended that OSM:

- Identify the types of studies, e.g. benefit/cost, economic impact, supply and demand, etc., that would be required to meet these goals.
- Identify, for each type of desired study, essential study resources that will be needed for its implementation, e.g. input data, personnel, time, and funding.
- Assess, for each type of study, the current availability of required study resources. This task will include such activities as:
    - identification of public and private research groups (not represented on the convened study committee) possessing expertise, experience, and interest in SMCRA-related topics.
    - identification and evaluation of existing analytical techniques for estimating impacts of surface mining, land reclamation, and other SMCRA-related topics.
    - identification and evaluation of potentially relevant data sources containing information that pertains to surface mining, land reclamation, and other SMCRA-related topics.

The current report is a significant first step in identifying these study resources.

Based on the preceding steps, it will be possible to identify, for each type of study, the resources that are required but are not currently available. OSM should develop strategies for acquiring these resources, and estimate the time, effort, and money that will be required to implement them. In addition, OSM should estimate the time, effort, and money that will be required to use the resources that are available. By adding the costs of the available and non-available resources, OSM will have developed a good estimate of the total costs of conducting an impacts study.

The estimated total cost for a study should be compared with the benefits that the study is expected to generate. On the basis of this comparison, OSM will be able to determine the desirability of proceeding with the study. It should be noted that:

- The value of certain information will be expressible in other than monetary terms, e.g. administrative benefits and impacts, and assigning monetary values to this information may be impossible. Explicit comparison of benefits and costs, as in a benefits/cost analysis, may therefore, be inappropriate.

- The decision to proceed with certain studies, or with studies under certain conditions, may appropriately be the prerogative of an authority other than OSM. OSM should, however, be privy to these decisions.

Research Plan, Short-Term

A certain amount of short-term research will be required to assist OSM in performing its day-to-day affairs. The assessment of research goals and study requirements discussed above will be useful in identifying areas that are amenable to analysis in limited periods of time or with limited resources. Since operating experience and ongoing research will continually alter information needs and the availability of study resources, short-term research activities will need to be reassessed on a periodic basis.

Research Plan, Long-Term

Decisions about undertaking desired studies, and about specific courses of action for these studies, are critical in long-term efforts where resource commitments are often substantial. For these long-term efforts, OSM should:

- Develop a research plan that will establish the order in which selected studies will be undertaken; designate dates by which they are to begin; and designate dates by which they are to end. In formulating this plan, consideration should be given to the relative priorities of the research goals that are associated with each study.

- Identify and schedule, as part of the research plan, programs that will generate the required resources that are currently not available. The order in which these programs are scheduled, and the dates by which they are to finish, will depend on the scheduling of the studies to which they provide data.

- Explicitly consider the coordination of studies and resource development programs whose activities are interrelated, e.g. results developed in one study may be needed to complete another study. Consideration of such coordination should be incorporated into the study plan; PERT is an example of a planning system that does this.
- Insure that the developed plan will be flexible enough to incorporate research findings that are generated as studies progress, and will be amenable to future alteration.
- Insure that, in studies to be undertaken or sponsored by OSM, the goals realistically reflect available resources, especially with regard to needed data. With the passage of time, the available data will grow, and goals for later studies can be made correspondingly more ambitious.
- Formulate, for its own studies, scopes of work that carefully specify the intended tasks, and budget sufficient resources to complete these tasks.

Although it must, of necessity, concentrate on developing a plan for its own research activities, OSM should consider—to the extent possible—the research efforts of others, and the coordination that might profitably be employed between its own efforts and those of others. Other Federal and state agencies may have interests or jurisdictions that are in some way relevant to OSM and SMCRA. It is therefore recommended that OSM:

- Consider participation by representatives of such agencies on the proposed study committee.
- Establish working agreements with such agencies on matters of mutual interest. Interagency agreements concerning the collection of data by one agency for use by another is an example of this type of collaboration.

RECOMMENDATIONS FOR SPECIFIC FUTURE RESEARCH

The following are recommendations for specific future research.

1. The Energy, Environment, and Resources Center (EERC), University of Tennessee, conducted a study (prior to SMCRA) of potentially mine-related damages that are incurred by households in the immediate vicinity of surface mines. Households were chosen as the unit of analysis because they are among the major recipients of mine-related damage, and because little data exists in this area of investigation. The quantification of household damages was to be accomplished by means of a questionnaire and a survey conducted in a sample of Tennessee watersheds. The questionnaire and sample were developed in a manner that permitted variations in household damages to be evaluated in terms of such significant variables as area of land disturbed , slope, and population density in each of the sampled watersheds. Data covered the 1960-1974 time period, and all damages were expressed in 1973 dollars.

The survey had been completed and a preliminary analysis of its results had begun when the sponsoring agency, the National Science Foundation, terminated this particular effort. The completed questionnaires are still available at EERC, and provide baseline damage experience under pre-SMCRA mining conditions. It is therefore recommended that OSM:

- Fund completion of the processing of the raw survey data into a usable form for analysis.
- Re-administer the questionnaire in the original survey's sampled watersheds to collect data under post-SMCRA mining conditions.
- Compare and evaluate pre- and post-SMCRA survey results to determine if inferences can be drawn concerning the Act's impact on mine-related household damages.

By implementing this recommendation, OSM will:

- Be able to explore an important aspect of damage abatement in a part of the country that has experienced severe negative impacts of surface coal mining (i.e., Appalachia), and which is expected to be significantly affected by SMCRA.
- Utilize pre-SMCRA data that is frequently unavailable for other geographic areas.
- Realize a savings in resources, since the basic designs of the questionnaire and survey have already been completed, and almost half of the survey effort (pre-SMCRA data collection, but not processing) has been accomplished.

Further details on this survey are contained in EERC's A Progress Report on NSF/RANN Funded Research Related to Environmental and Economic Aspects of Coal Production, December 31, 1974; this report is summarized in Appendix 1.

2. As was noted in the Findings of Chapter VI, the practice of wildcatting among surface mine operators is reported, in Appalachia, to be extensive, and is potentially very destructive to affected environments. Although avoiding compliance with SMCRA through wildcatting is illegal, other mine operators also avoid compliance, but legally.

Under the Act, mine sites no larger than 2 acres are exempted from compliance requirements. Since they are unregulated, these mine operations are potentially very destructive, albeit in limited areas. Cumulatively, the environmental damage caused by them may be substantial. In addition, it has been reported that parties owning mining rights to tracts of land greater than 2 acres have either mined only 2 acres of the land at a time, or have subdivided it into 2-acre sites and then leased the sites to other mining interests. In this way, they have been able to avoid compliance with SMCRA. It is obvious that, though in technical compliance with the Act, these practices can have consequences similar to those of wildcat operations.

It is recommended that OSM:

- Investigate and document the extent to which wildcat operations occur in Appalachia.
- Estimate the environmental damage caused by wildcat surface mining in Appalachia (evaluations would be conducted on a site-specific basis).
- Estimate the environmental damage caused at unregulated 2-acre mine sites by surface mining operations (evaluations would be conducted on a site-specific basis). Although the investigation of 2-acre operations might be conducted for all major coal regions, Appalachia, with its preponderance of smaller mines, is probably the most fruitful region to investigate.
- Investigate, if environmental damage from unregulated mining at 2-acre sites appears significant, the pervasiveness of the practice of subdividing large land areas into 2-acre sites to avoid SMCRA compliance.
- Formulate, if damages prove to be significant, possible requirements or regulatory initiatives to control these types of abuses.

Initial estimates of environmental damage will almost certainly be expressed in physical units; wherever possible, these units should be converted to monetary terms, which express damage in a common unit of measure.

3. A major criticism against SMCRA's requirement that disturbed land, except for mountaintop removals, be restored to approximate original contour (AOC) is that, under certain circumstances, other reclamation techniques may prove superior. AOC reclamation sometimes results, for example, in long uninterrupted slopes on steep hillsides. Unless vegetation can be quickly established on these slopes, or a similar ground cover can be employed, severe erosion may result. On sites where slopes are steep and revegetation is difficult, non-AOC forms of reclamation may prove more effective.

Concern has also been expressed that the effectiveness of AOC reclamation may be diminished if this requirement is not enforced with sufficient flexibility. Under the current regulations, for example, alteration of the reclaimed land's topography from its pre-mining configuration may be forbidden, even when it would support a higher post-mining land use. The frequency with which this happens will depend on the degree of enforcement flexibility that is employed.

It is recommended that OSM:

- Initiate detailed evaluations of AOC reclamation under a representative sample of mining conditions. These evaluations should explicitly consider the influence that variations in enforcement flexibility have on effectiveness and cost. The results of the analyses should be combined into a cost-effectiveness appraisal of AOC reclamation.

- Formulate alternative reclamation procedures that are consistent with current SMCRA requirements and that could be substituted for AOC reclamation. These alternatives should be subjected to the same kinds of cost and effectiveness analyses as AOC reclamation.

- Formulate alternative reclamation procedures that are not currently consistent with SMCRA requirements and that could be substituted for AOC reclamation without loss of regulatory effectiveness. These alternatives should also be subjected to the same kinds of cost and effectiveness analyses as AOC reclamation.

- Determine, on the basis of the preceding cost-effectiveness analyses, the most effective known techniques for dealing with various mining conditions, and the levels (or range of levels) of enforcement flexibility that are appropriate for each.

The Energy, Environment and Resources Center (EERC) at the University of Tennessee has proposed a study that would apply a selected set of reclamation techniques, not all consistent with SMCRA requirements, to experimental mine sites (one technique per site) and would collect detailed cost and effectiveness data for each technique. Implementation of this study would require that OSM exempt the test sites from SMCRA regulations. OSM should consider granting such exemptions and funding this research; the research would supply empirical results that could be quantitatively analyzed, and would be applicable to the severe mining conditions in Appalachia.

In evaluating alternative reclamation techniques, OSM should conduct evaluations on a site-specific basis. Experience with the proposed EERC project would provide guidance for subsequent site-specific analyses.

4. To return a mine site's post-mining soil structure to its pre-mining state, SMCRA requires that topsoil and the first three soil strata (i.e., A, B, and C) be stored separately as they are removed, and be replaced in the same order. Designed to protect productive agricultural land, this requirement has been criticized under certain conditions. These conditions include:

- Surface mining on steep slopes, where the layer of arable soil is often very thin and the affected terrain is so rugged that crop cultivation is virtually impossible. Under these conditions successful forestry can be undertaken, but this form of agriculture benefits least from SMCRA's soil preservation requirement. The preservation of soil structures may, in such cases, add greatly to mining costs, but contribute little to post-mining land use.

- Certain farming regions, where soil conditions will actually be improved if a certain amount of alteration of the soil structure occurs. Under current SMCRA requirements, this blending of soil (including topsoil) cannot be undertaken as part of a reclamation program if the site has been surface mined. wrong

cannot be undertaken without a variance

Agricultural authorities contacted by the study team have noted that, while in many respects effective, this and similar reclamation requirements (e.g., AOC reclamation) cannot reproduce certain pre-mining conditions, such as original soil compaction. Rigid adherence to, and inflexible enforcement of, such regulations are therefore of uncertain value.

It is recommended that OSM:

- Estimate the benefits and costs that accrue from SMCRA's soil preservation requirements under steep slope mining conditions. The effects of enforcement flexibility should be considered in these estimates, and the results should be combined into a benefit-cost evaluation of the requirements under steep slope conditions.
- Estimate the benefits and costs that accrue from SMCRA's soil preservation requirements under a sample of soil conditions found in major agricultural areas (including those conditions where soil blending may be beneficial). The effects of enforcement flexibility should be considered in these estimates, and the results should be combined into a benefit-cost evaluation of the requirements under a range of soil conditions.
- Estimate the benefits and costs that accrue to SMCRA's soil preservation requirement under a sample of other (non-soil) conditions that may affect reclamation effectiveness, e.g., mining under arid conditions found in much of the West. The effects of enforcement flexibility should be considered in these estimates, and the results should be combined into a benefit-cost evaluation of the requirements under these other conditions.
- Consider, in instances where SMCRA's soil preservation requirements appear on the basis of benefit-cost evaluations to be ineffective, alternative procedures that would better protect or improve soil utility.

The preceding benefit and cost analyses should be conducted on a site-specific basis.

5. Each SMCRA requirement has a set of goals that should contribute to the preservation or enhancement of mined land's utility for post-mining applications. To attain the goals for any particular requirement, OSM may either specify the degree to which a goal is to be met, i.e., set performance standards, or may specify procedures that it feels will insure that this goal is satisfied, i.e., set design standards. SMCRA regulations employ both standards. The use of design standards by regulatory agencies may be justified on grounds such as the following: their use avoids controversy over the nature of a performance standard and the degree to which a mine's proposed approach meets it; developing techniques for compliance with a performance standard may be too costly or demanding (in required technical expertise, for example) for many of the regulated parties; and the use of design standards prevents possible environmental damage that may occur when only performance standards are used.

Although design standards reduce controversy concerning interpretation of goals and the degree of goal compliance, and relieve mine operators of the need to develop their own compliance procedures, they are also more difficult to develop when they must be applied to a wide range of operating conditions. A design standard that functions effectively under one environment may do less well in an entirely different environment. To a point, the problems created by multiple operating environments can be dealt with through the careful formulation, and flexible enforcement, of standards. When carried to extremes, however, such a strategy may produce design standards and/or enforcement efforts that are ineffective under any conditions.

It is recommended that OSM:

- Identify SMCRA design standards that are potentially affected by site-specific conditions.
- Determine if, in practice, the effectiveness of these standards varies significantly with variations in site conditions.
- Determine, for standards whose effectiveness is diminished by variations in site conditions, whether the standards can be reformulated, or the enforcement efforts modified, to accommodate these variations without compromising the essential success of the regulatory efforts.
- Explore, for standards whose effectiveness is diminished by variations in site-specific conditions, and which cannot be reformulated or flexibly enforced without further loss of regulatory effectiveness, the possibility of developing alternative performance standards that could more readily cope with variations in operating conditions.

The following SMCRA requirements are potential candidates for this appraisal:

- Requirements for sedimentation ponds
- Requirements for segregated soil storage and replacement
- Requirements for waste dams
- Requirements for monitoring and control of blasting
- Requirements for design and construction of mine roads
- Requirements for design and construction of mine drainage systems.

6. The general methods and specific techniques of reclamation that will be used for compliance with SMCRA and the permanent regulations are, in many cases, subjected to question or are characterized as being excessively costly to the operator. In some ways, this is to be expected, since the experience

of this country's regulatory agencies and operators with strict environmental standards is limited. It would appear that something may be learned from examining closely the more lengthy experience of other nations, particularly Great Britain and West Germany. These countries have long required surface mining operations to meet detailed environmental regulations, such as those dealing with the handling and placement of overburden and topsoil, and to pre-plan reclamation in line with a desired post-mining land use. It is therefore recommended that OSM:

- Compare the surface mining and reclamation requirements of Great Britain and West Germany with those of SMCRA and the permanent regulations.
- Examine further the sections of the British and West German regulations that are different from those of SMCRA and the permanent regulations, and assess the usefulness of these requirements for meeting the objectives of SMCRA.
- Evaluate the methods and technologies used in these countries to meet desired environmental objectives, and identify those that can profitably be transferred to the American coal industry to meet the requirements of SMCRA and the permanent regulations.

7. The possible designation of certain areas as unsuitable for surface coal mining has generated much controversy among mine operators, environmentalists, various states, and other interested parties. A large number of reserves are potentially affected by this portion of the Act, and the need exists to define further the criteria for designating areas as unsuitable for surface coal mining. Under the permanent regulations, States will conduct the actual evaluation of lands as suitable or unsuitable for surface coal mining; nonetheless, it may be prudent for OSM to take the lead in developing comprehensive guidelines and procedures. It is recommended that OSM:

- Develop more detailed criteria for designating lands as unsuitable for surface coal mining, using as a basis the requirements presented in SMCRA and the permanent regulations.
- Assess the data requirements needed to make such determinations, and identify national and state level data sources that can provide this data.

ADMINISTRATIVE RECOMMENDATIONS

The following are administrative recommendations for future research.

1. Current research into appraising the impacts of surface mining, reclamation, and other SMCRA-related topics is hindered by insufficient knowledge about the identities of research groups who are active in this field, and by the absence of communication and coordination between these

groups. Although assessments of SMCRA-related topics can be made independently of any outside group, such a strategy ignores the inherent advantages of utilizing knowledge and data that already exist. Independent assessments often result in duplication of effort, and may lead to the pursuit of research alternatives that have already been explored and proven to be unproductive. In terms of future research, results from current and past efforts, if known, may suggest fruitful areas for investigation that might otherwise be ignored. It is therefore recommended that OSM:

- Identify all possible research groups that have been, or are, engaged in significant research that is pertinent to assessments of SMCRA.
- Establish communications with these groups both to facilitate the exchange of information and to encourage future coordination and cooperation between the contacted groups themselves, and between them and OSM.

2. Although research studies and data sources related to SMCRA are diffused and difficult to locate, this information is of considerable value to those who are concerned with the administration and evaluation of the Act and its regulations. It would be very helpful to have a centralized group that would monitor:

- Research groups engaged in activities directly or indirectly related to SMCRA
- Existing and future reports related to SMCRA
- Existing and future research activity related to SMCRA
- Existing and future data sources that are of potential value to assessments of SMCRA.

As noted in Chapter VI, OSM is the federal agency with primary responsibility for matters pertaining to SMCRA; it is the agency to which other federal and state groups turn for guidance in Act-related research.

It is, therefore, recommended that OSM establish an internal research monitoring capability (e.g., office or group) that would perform the kinds of monitoring tasks described above. This monitoring capability would be of internal value to OSM, and would help in providing guidance to other interested groups.

3. As noted in Chapter VI, appraisals of the impacts of surface mining, reclamation, and other SMCRA-related topics are hindered by a lack of existing data and/or an incomplete knowledge of the reclamation processes involved. For this reason, it is recommended that OSM:

- Focus its near-term research efforts on site-specific case studies. This approach is consistent with current research practice in the field and minimizes the problems that arise from incomplete information. At the site-specific level, needed information can more readily be created during the study itself, thus reducing the dependence on existing data sources.

- Incorporate, where possible, the data collected in site-specific studies into integrated data bases that can be employed in later research.

- Explore, as additional data becomes available, opportunities to conduct similar investigations for geographically larger areas (e.g., states, regions (multiple states), and the entire country).

4. Although the powers granted to OSM under SMCRA are legislatively established and have not been questioned, its inferred powers, as reflected in its regulations, are being challenged in the federal courts. If one or more of these challenges are upheld, or if a new Administration or Congress should curtail some of OSM's powers, its enforcement efforts and/or regulatory effectiveness may be hindered. It is therefore recommended that OSM:

- Identify which of its inferred powers are potential candidates for elimination or curtailment.

- Determine if alternative strategies can be developed and implemented that would offset the loss of these rescinded powers.

Appendix III

Additional Material Submitted for the Record

CONSOLIDATION COAL COMPANY
INCORPORATED
SOUTHERN APPALACHIA REGION
POCAHONTAS, VIRGINIA 24635

August 31, 1981

The Honorable John Warner
Chairman
Energy and Mineral Resources Subcommittee
Committee on Energy and Natural Resources
3104 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Warner:

Consolidation Coal Company (CONSOL) appreciates this opportunity to present comments on the Office of Surface Mining's (OSM) implementation of the Surface Mining Control and Reclamation Act of 1977.

CONSOL is this nation's number two coal producer with operations in most of the major coal regions throughout this country. We have been greatly impacted by the Surface Mining Act and its many here-to-fore complex, cumbersome and often counter-productive regulations.

This is an important period of change in OSM's program. Many of the states are assuming primacy while many of the overly burdensome regulations are being revised. We applaud OSM's efforts to revise these unreasonable regulations. These revisions parallel President Reagan's stated goal of eliminating unnecessary and excessive government regulations.

While the prior administration regularly preached "state lead" or "state primacy", it created complex regulations which were required to be incorporated almost verbatim in the individual state programs. This, in effect, took away the state lead. The current OSM administration has proposed changes that will enhance the state primacy concept by allowing the states to tailor their programs to specific terrain, climate, and other conditions which vary from state to state.

The prior administration relied heavily on design criteria instead of performance standards. The regulations have been unnecessarily inflexible and have added tremendously to the cost of mining without providing any additional environmental protection. These overly-restrictive regulations have served to freeze creative design and engineering advancement. We have recently been encouraged by the appearance of draft revisions to the regulations which would eliminate some of these design constraints and allow for more site-specific design. We commend the present administration for this common sense approach. We certainly hope that OSM continues with this regulatory reform.

We would also like to voice our approval of the proposed re-organization of the Office of Surface Mining. With many of the states already granted complete or conditional approval of their programs and most of the others expected to obtain primacy within a year, it is logical that OSM should be re-organizing and cutting back on their program. The need for the extensive regional structure of OSM is eliminated as inspection and enforcement becomes the responsibility of the states. In accordance with the Act, the federal role is reduced to one of oversight and hence, no longer requires the manpower that was necessary under the interim program. The time for re-organization is now, before the bureaucratic machinery becomes entrenched and self-serving.

We have not addressed statutory reforms in these comments. We prefer to allow the administration time to achieve their regulatory reform without delay and interuption. If the regulatory action is not sufficient to remedy the statutory deficiencies, it will then be appropriate to attempt legislative changes.

Again, we would like to commend OSM for their recent regulatory reform efforts. While we may not agree entirely with all of their proposed changes, we do believe they are headed in the right direction and they deserve the full support of your committee.

Sincerely,

Claude D. Morgan

Claude D. Morgan
Supervisor
Environmental Quality Control

CDM/dhy

August 31, 1981

Senator John Warner
Richmond, Virginia

RE: Viking Mining Corporation
Drawer II
Grundy, Virginia 24614

Gentlemen:

Viking Mining Corporation located at Conaway Creek, Buchanan County, Virginia, has spent over $5,000.00 doing bulldozer and backhoe work in putting in pipes to meet with the Office of Surface Mining standards. We have disturbed at least an acre of land to put in five ponds and eight ditches, and installed six underground drain pipes to conform to the OSM requirements.

For ten years, Viking Mining Corporation haulage road has been in use and in compliance with the Federal Mine Safety and Health Administrations standards but the road does not come near the Office of Surface Mining standards.

Sincerely,

Leon Stevenson

Leon Stevenson, President
VIKING MINING CORPORATION

August 28, 1981

Honorable John Warner
United States Senate
Washington, D.C.

Dear Sir:

Why does a country as great and powerful as the United States of America have to be so dependant upon foreign nations for resources for our energy needs? Is the United States not one of the richest in the world in natural resources? Why then do we not make use of these resources? Could it be because there are so many federal and state regulations to meet, that it makes it absolutely impossible to economically tap these resources.

I live in Southwest Virginia and I'm sure that you are aware of the topography of this area. I work for a coal company and I depend upon that coal company for my existence. Why then has this company and other coal companies in Buchanan County and surrounding areas continually been harrassed by Federal and State Regulatory Agencies? With orders to build ponds, drill wells, ect. that have not accomplished that much and are not benefical to residents and some are so preposterous that they are ridiculous. There are nine agencies of federal and state that stand over you to see that you comply. Do you not think that is overlapping regulations? Are we to be forced out of business? Are we to lose our jobs and join the ranks of the unemployed in Virginia? Are we to take food from people's table in order to protect the grizzly in Colorado or the seal offshore in California.

The people agree and the coal companies agree, that there is a need for a reclamation program. That is not to be accomplished by overlapping regulations and agencies. Have you sir, yet to see them agree on anything? We are aware of Mr. Regan's campaign promise to do away with some federal regulations and return control to the states. Is what is happening to the coal industry not a good example of over regulation. To whom do we listen to?

According to O.S M. regulation, the land must be returned to its orginal contour. It is far easier to restore a prairie out West to its orginal contour than a 2500 feet mountain in Buchanan County. Only God could do that. Why has Mr. Udall and his friends not come to Southwest Virginia and seen what type of terrain we have to deal with? Why do these people set in judgement and make the laws when they have no idea what type of terrain they are talking about?

The Surface Mining Control and Reclamation Act of 1977, their intentions were good, but like most laws they have grown out of proportion to the extent that it does more harm than good.

Unless there is a change in the present system of reclamation, regulations and overlapping of agencies, the Coal Industry, not only in Southwest Virginia but across the nation, is doomed.

Sincerely;

Carolyn J. Clevinger

PROPOSED STATEMENT OF COMMITTEE TO LEGALIZE COAL OF THE VIRGINIA COAL ASSOCIATION BEFORE SENATOR WARNER'S OVERSIGHT HEARING

Richlands, Virginia on September 2, 1981
Southwest Virginia Community College
Russell Hall

Thank you for the opportunity to express the concerns of a number of those coal operators still actively mining coal in southwest Virginia since the advent of the Federal Surface Mining Control and Reclamation Act of 1977. The presence of this Committee in southwest Virginia, offering an opportunity to those concerned with the coal mining industry and the environment of this region to speak directly to those responsible for overseeing the federal regulation of this industry is very much appreciated by the members of this group.

It is my desire to make a brief statement on the current effect of OSM regulations on the coal industry as a whole and the inter-relationship of the small contract operator to the two acre exemptions provided in the Surface Mining Control and Reclamation Act of 1977.

The small contract operator engaged in underground mining has been an important part of the Virginia mining industry for several decades. Records of one major coal company in southwest Virginia and its predecessor companies indicate that contract mining existed in southwest Virginia as far back as the late 1940's, well before the Federal Surface Mining Act was conceived, and prior to the development of the common use of surface mining in this region. Today this same company's records indicate that small contract coal operators account for a significant portion of the industry. For example, in the first quarter of this year, less than two acre operators accounted for almost 300,000 tons of coal mined and employed over 300 men. This was a significant portion of the total production for that particular company.

Small coal mining operators in the southwest Virginia region are a special and unique business enterprise occupying an area of an industry which they alone can fill. Through efficiency of operation, these small operators can mine areas of coal deposits which larger coal mine operators cannot economically recover and which would otherwise be lost. This efficiency of operation is eliminated if small operators are compelled to expend the substantial sums (approximately 45,000 to 50,000 per permit for information gathering alone) imposed on large coal mining operators by O.S.M. regulations, as some in that agency would require by interpreting the so called two acre exemption [§ 528 (2) of the Act] in such a way as to render it meaningless.

While the regulations published in the lame duck days of the Carter administration indicated that the less than two acre exemption was restricted to the "mom and pop" or "pick and shovel" operation, such a characterization of present day small coal mining operators is a reflection of a lack of knowledge of modern coal mining practices. Since the passage of the Mine Health and Safety Act of 1969, if any underground mine operator goes into mining it has to produce enough tonnage to be able to pay for the cost of certain safety items required by the Mine

Health and Safety Administration. Examples of the approximat cost of basic items of safety equipment include the following:

methane monitor (installed)	$3,000
methane detector	$300 to $500
respirable dust pump	$435
selfrescuer	$500 apiece

Certainly no one can quarrel with the goal of protecting the safety of miners, but it should be recognized that achieving this goal is expensive, and the cost is borne by the coal operator. This cost has essentially eliminated the "doghole" operators who cannot produce sufficient tonnage to pay for these safety items. The typical small coal mine operator today employs 10 to 12 miners, has modern electric mining equipment (invariably mortgaged) and has purchased the mandatory safety equipment necessary for the protection of his employees. To superimpose on top of all this the cost of all of the O.S.M. regulations as certain elements of that agency would have done by interpreting the two acre exemption in such a way as to render it meaningless would effectively put many of these small coal mine operators out of business. Such a result cannot be justified in the guise of total environmental protection when the limited effect on the environment of underground mines which disturb a surface area of less than two acres can be effectively controlled by the specific regulations for less than two acre sites contained in the permanent program submitted by the Virginia Division of Mined Land Reclamation, and the regulations premulgated by the Environmental Protection Agency an enforced by the Virginia State Water Control Board.

The significant points yet to be recognized by O.S.M. to date are that: (1) there are substantial amounts of coal which will not be mined without small contractors because of the economics of the industry; (2) the coal is an important part of the mineral wealth of Virginia; and (3) large inter related parts of the economy of Virginia rely on substantial levels of production of which the two acre sites and small operators are integral parts.

In the months since January 23, 1981, when O.S.M. published the most recent less than two acre regulations (which were recently withdrawn) a group of attorneys, engineers and operators of various mining enterprises have been diligently working directly with the Virginia Division of Mined Land Reclamation (DMLR) in an effort to effectively deal, at state levels, with the less than two acre mine site. We believe we have a solution and that this type of cooperative effort should be encouraged by O.S.M. Additionally, the group has done extensive work on the question of haulroads which is an integral part of the less than two acre mine site and small operator question.

We would like to go on record now stating our support for the more rational approach of regulation develop ment we have noticed since the first of this year. We support the shift from design criteria to performance criteria which we have noticed in the proposed sediment pond regulations. This approach mirrors the EPA regulatory scheme which delineates water quality criteria which must be met, and leaves the methodology for meeting the criteria to the industries which are regulated. We like this approach because we feel we have the expertise to design and implement sound environmental control methodo logies.

Similarly we support the move to align refuse disposal regulations with the current MSHA regulations. We feel this will be a more rational approach than using the highway design criteria which had initially been included in O.S.M. regulations. We would like to see this trend continue. One area we believe should be a target of this approach is the approximate original contour requirements (A.O.C.) in steep slope areas. You have seen the deeply divided steep slope terrain of southwest Virginia, and we firmly believe that approximate original contour would be a detriment to future development in this region. There is ongoing research at V.P.I. which is demonstrating the tremendous agricultural development potential of the surface mined benches in our region. They are currently demonstrating the economic feasibility of cow/calf operations on abandoned benches. And, this program doesn't even address the potentials of benches which could be reclaimed specifically for agricultural or other land uses.

Flat land is at a premium in our region and there is some evidence to indicate that A.O.C. is not environmentally sound in steep slope areas. Runoff increases because the slopes are not broken and consequently more suspended solids are introduced into the surface regime. Additionally, in steep slope areas potential unstable situations are created by A.O.C. We feel that during the development of the A.O.C. regulations more attention should have been paid to the U.S. Bureau of Mines' report entitled Bond Release Criteria which stated that A.O.C. is not the best approach in steep slope areas where flat land is at a premium and mining costs can preclude the economic extraction of a valuable resource.

Our obligation has been to show Virginia O.S.M. and concerned citizens everywhere that by working together with DMLR and recognizing the federal role in mined land reclamation and the environmental needs of Virginia that well reasoned economically feasible answers can be found to the problems of the less than two acre mine site and the small operator, and other regulatory problems. All that is needed is for the flame of cooperation and understanding not to be smothered before it sheds its light.

Warfield Coal Company, Inc.
Harman, VA 24618

September 1, 1981

The Honorable Jack Warner
United States Senate

Dear Senator Warner:

When countless laws are needed to perpetuate the feeding of the Federal animal, we must look to our legislators to inquire into, or to curb, the feeding of this beast. OSM overseers have dined richly at the expense of the operators while our fare has been but bitter fruit.

It is extremely difficult, nowadays, to see the forest because of the trees. Should we begin to see even a glimmer of a grand design behind all the trees, another asinine law will rear itself to obliterate the view.

No one is more concerned with proper reclamation procedures than the mine operator. As a businessman he wishes to please OSM, he wishes to please the landowner and he wishes to get on about his business. This is known simply as survival. But when the good deeds are all done and he has moved on, certain laws will surely yank him back to the present and sometimes, put him into bankruptcy.

A classic example of delayed-law is sedimentation ponds. When this work of art has the approval of inspectors and landowners, when it is properly filled with sediment and vegetation, when the operator has long moved to other pastures, then--HOLD JUST A DAMN MINUTE! Go back and move it! Bring your equipment back--somehow--build a haul road to the pond--somehow--take the dirt to the top of the hill--somehow--and spread it out evenly--somehow. And in the process, leave an open sore of a silt-pond to collect again the dirt you have re-distributed at the top of the hill. Is OSM trying to invent perpetual motion, or to prove its asinity?

Then we have haul roads. Haul roads, sir, are not what you and I and other sensible people think they are. No, we must read fifty pages of federal instructions on what a haul road is, and then we are left with the puzzling concept of a road coming from a hill over which coal is transported. That is somehow vaguely familiar, but after reading fifty pages of legal and technical jargon, one tends to get a little vague about everything.

I always thought that so long as man or beast or coal trucks could peaceably navigate a road, then that road should be suitable for the purpose intended. After all, who would willingly harm their $100,000 coal truck, or break the leg of his mule? But no, these valuable material things are not the concern of the OSM geniuses--their concern is that a mighty flood might be raised by this little haul road and disturb a rabbit in this hollow or a squirrel in the other hollow. You must understand, sir, that this water, based on a peak ten-year "precipitation event", must be made to run slowly despite the exaggerated use of ditches and culverts. OSM now switches from perpetual motion to dabbling with defying gravity. What is a little $200,000 road re-building job to CSM? Especially since the operator has long quit the job, and barely broke even?

The restoration of stripped lands to their original contour has aroused more indignation than all the other absurdities combined. We won't speak of all the future uses that flat land would leave us; we won't speak of the intolerable burden that complete restoration places on the operator. We will speak instead of "words", from which all these evils sprang in the first place: Federal regulations make great and frequent use of the term "post-mining use." Everything is somehow equated or justified by stressing "post-mining use". That term suggests a whole Pandora's Box of goodies and golden opportunities, and soothes the ear of many an ecologist. All right, Senator, let's begin: You name just one good "post-mining use" for which this steep hillside land could be used. Okay? Take a few minutes--or hours--hell, I've thought since 1977 and still can't think of one. Maybe a stand of timber 60 years from now? No, the loose slope won't permit it. An orchard? No, only fools and lazy people let fruit roll to the bottom. Pasture, maybe? Too bad livestock can't talk. Game? You ever see a rabbit or deer on a steep slope? To continue in this vein is disgusting.

Perhaps the ecologists and such had in mind the rolling hills of mid- and upper Virginia, or Ohio, Illinois, western Kentucky or Wyoming. Sure, anyone can find a use for that land. But only a fool would lump these different land masses under the same law--and it's obvious a whole bunch of them managed to do it.

I invite you, sir, to take this little peek at the awesome burden OSM and ecologists have placed on the operator: Suppose--just suppose, for once--that all coal operators went on strike. A real and critical national emergency would exist, and OSM would have to assume direct management. Now, which of their thousands of directives would they declare "excessive", "unnecessary", "ridiculous", "impossible"? Maybe 99% of them? I think so, Senator, I really think so--and so would you if you were on this side of the business. Why, then, do we allow them to be written? Or, once written, why should they become the sacred cows of non-revision?

These steep hills abound with the evidence of the 1977 Reclamation and Enforcement laws. The ravages of this "stripped land restoration" can be seen from the air or from the road--or up close, even, if you don't mind venturing too close. These are the "restored" land the environmentalists have forced on us, and the results must be laid directly at their feet. These lands are now worthless, unstable eyesores, dotted with scrub bushes and briars and laced with yellow-banked gullies. This is the land our environmentalists, ecologists and OSM have fought so hard to preserve--in the precise manner in which they are being preserved. They are unwanted, miss-shapen mountains of neglect now that no "post-mining use" can be put to them. If this be success in their eyes, I would hate to behold one of their failures.

Had the environmentalists not meddled, a different picture could be seen. Had they left the land graded and gently rolling instead of "restored", one might see a retired worker mowing his hay with a tractor, probable with a grandson or two hanging on. One might see them cultivating an orchard or chasing the calves or laying out a house plot. Overall, one would surely see more retired people settling and using the land, rather than leading an exodus from it, now that the coal has gone.

When the Queen of England said of her starving masses, "Well, let them eat cake!" she showed as much vision and farsightedness as her contempories, Mo Udall and Teddy Kennedy. I would like to sell those two gentlemen a lot of land around here--I cannot think of anyone more deserving of it.

Senator Warner, there is a solution to all this--a solution that would let you write your own ticket in the political world. What must be done--by you or someone else--is to mount a loud-and-clear no-nonsense campaign, proclaiming "I want my stripped lands restored to an angle no greater than will support a farm tractor, and no less than will provide adequate drainage." Think on that awhile, sir, and you'll find that you cannot lose on a platform like that. The coal people will love you, the agriculture community will love you and the ecologists will love you.

You could cite the dwindling world food supply and the need for agricultural resurgence; the ecologists will agree that farmed land is balanced land, and the coal people will feel that they are finally contributing something useful. The problem of haul roads would be solved: leave them intact for future use. Silt-dams could be left intact, brimming with water for livestock or for irrigation.

Clearly, something must be done in the future to increase coal production and to stop this awful waste of natural resources. President Reagan would be delighted with this proposal, wouldn't you think?

Remember, the key word is farm tractor. Knowing America's affinity for farming, you could park one in the President's driveway and be applauded. Please give this serious consideration, Senator, and let us know if you agree with our position.

Sincerely,

Charles Marshall

Charles Marshall
President, Warfield Coal Co.

Maverick Mining Corporation
P. O. Drawer II
GRUNDY, VIRGINIA 24614

August 31, 1981

Honorable John W. Warner
United States Senate
Washington, D. C.

Dear Sir:

Being a member of the small business community, I sincerely wish to thank you for espousing the cause of all energetic Americans who are incredulous and shocked as to the lengths that Congress has gone in oppressing industry in the United States. We, for instance, certainly can't conduct our coal mining operations in a safe, sane, and economical manner when we are constantly assaulted by the legions of "instant experts" that Congress has created to manage our affairs. This entire situation is synonomous with both socialism and slavery, with us being the direct victims and, thereby, causing the entire land to bleed needlessly.

One of the great philosophers once said that a democracy would work well and prosper untill the people of the democracy learn that they can vote their hands into the treasury. This is exactly what has happened in the United States. Little by little, the idle, shiftless, lazy and unambitious elements of our society learned that if they voted together, they could control Congress and create a welfare state at the expense of those who are ambitious and energetic enough to work and pay the ever-increasing taxes necessary to support the parasites and their sponsors.

The rolls of the parasites were swelling at such a rate that Congress had to do something to keep taxpayers on the payrolls. So, being no bunch of dummies, they thought up the very formula to appease those that still pretend to want to work - - - REGULATIONS! This one word is without doubt the single most horrendously destructive catastrophe that America has suffered since its inception.

Regulations have already destroyed many businesses and have infested almost all others with a cancerous-like disease that is making them die a slow, painful, and expensive death.

Coal mining on a small scale is the only business that we are personally acquainted with, but we read and hear what goes on in the rest of the country and the world. For example, it takes five Americans with three times the space to produce the same amount of automobiles that one Japanese worker produces. Why? Why are we spending well over fifty billion dollars per year for foreign oil when we could be energy self-sufficient with a much lower price tag if we could mine our coal without the staggering costs added by government interference and regulations? How can any business function when all managerial rights are stripped from them? All that management has time for now in the coal industry is; to try and manage to coddle and kneel to inspectors; to listen to ridiculous grievances by employees; to fill out and file hundreds of reports to various agencies; to apply for dozens of permits and licenses that, more often than not, are granted (if at all) when a ridiculous amount of time has elapsed; to experience futility in endeavoring to keep abreast of new regulations and not forget the thousands that are already in effect; be at the beck and call of any agent or inspector who wishes to demand the time that you don't have and can't afford.

Yes, the plague was loosed on the coal mining industry in 1969 and has adversly affected it to the very core. In 1969, we had a prosperous small mining business. We operated and managed our mine in a safe and efficient manner. Our equipment was non-permissible and relatively inexpensive. The crew was a happy, satisfied and hard working bunch. No one had "black lung" in those days or thought about it. The older miners sometimes mentioned having "shortness of breath" but that was properly attributed to smoking too much and the natural aging process. Now, thanks to the 1969 coal mining laws, we don't have many older miners. They have practically all retired on a too lenient "black lung" and disabled social security program which the 1969 act perpetrated.

In 1969, Harman Mining Corporation paid us $3.50 per ton for coal mined by us and trucked to their processing plant. We got along nicely and made a decent profit! Let me tell you very emphatically that things have made some very drastic changes for the worse!

Since 1969 we have become criminals in the eyes of the law of the land. We can be arbitrarily charged, tried from a distance, convicted and fined if our actions do not please the powers that be. We can even be handed prison terms! We have been relieved of our managerial duties, had our place of business stolen by the government and our employees, gone into debt more than a half million dollars, suffered the indiginity of catering to the whims, caprices and harassments of agencies and agents, lost unrecoverable time in securing useless permits and licenses for everything we wish to do. We have also seen our employees change from hard working, honest, loyal and reliable into lazy, belligerent, tratiorous, irresponsible, irregular and dreamers of drawing "black lung" and disabled benefits.

In the past, little more than a decade, we have witnessed the swelling of five Federal and three Virginia inspectors into literally hundreds. They have changed from an advisory status into a tyrannical and dictatorial monstrosity with about as many individual opinions as there are individuals. Now they have been and are being joined by other "enforcement" agencies such as O S M.

It amazes me personally to drive along our local roads and see that about one tenth (or is it one half?) of the vehicles that I meet or follow bears "official" license plates. At least seventy-five percent of the other vehicles glutting Buchanan County's highways and burning our too-expensive fuel are driven by the non-taxpaying parasites created by governmental regulatory policies that makes it much easier and more lucrative not to work.

Before 1969, any industrious and knowledgable coal miner could save a very few thousands of dollars and "open" a small coal mine to provide gainful employment for himself and eight or ten others. Not so today! Now the government demands that we erect an edifice such as would be left to posterity and surround it with dams, lakes, forests and four lane access roads. Then, when three or four years have elapsed and you have gone bankrupt, or, have managed to mine the little scam of coal out (all the while with nine-or is it thirteen-agencies and their representatives breathing down your collar) you must destroy and remove without a trace this monument to waste.

Before any of the above can occur, however, we must engage chemists, geologists, attorneys, engineers, drilling crews and road builders just to see how much impact on the cosmos that our little venture might have. Then, after all this information is gathered, we must wait up to near two years for approval by someone in Washington that dislikes coal mining anyway.

Another interesting bit of information is that instead of $3.50 per ton, we now receive more than $20.00 per ton and are losing money and becoming more indebted daily. Since the U.M.W.A. contract strike in 1978 (which the government subsidized by handing out food stamps and unemployment benefits) our little company has gone in the red almost $300,000.00.

We are loyal, productive and patriotic citizens of the United States of America. What about our rights and those of all the other regulated small and large businesses in America? We provide the jobs of this country and if you will get too much government off our backs, we'll solve our own problems and get things rolling again through work, production and free enterprise.

The Constitution gave Congress many powers, and among them was the power to regulate commerce with foreign nations and among the several states, and with the Indian tribes. Only someone with a misguided sense of responsibility could interpret this to mean that the government should get itself involved to the point of establishing the rules and methods of how everything has to be accomplished. The government is not composed of automobile manufacturers or coal miners. Let us who are make our automobiles and mine our coal. Can't you see that you have bungled the whole lot. Let the Udalls and Naders landscape their own properties and repair their own appliances and leave ours alone.

We charge the Congress of the United States with being solely responsibile for the chaos that the economy is in. They have taken away the rights and ownerships of the businessmen of America and given them to the employees and the various and sundry agencies who don't give a damn if the business survives or not.

In summation, and being somewhat repetitious, all that Congress has left the erstwhile directors of the economy is a stigmatized title, an accelerated aging process, no dignity and pride, a possible prison term (no guillotine, please!), a business that is non-productive and on the rocks, harassment, suffocation in the red tape, citations, fines, ridicule, high costs and the guarantee that if he makes a dime in spite of all the above that you will tax him eleven cents.

And so, honorable gentlemen please, don't waste any of the tax payer's money by creating any more regulatory agencies.for our benefit, as they would be a further absurdity. OSM, MSHA, et. al., are more than enough, and any others would be overkill.

Please excuse me for sounding sarcastic, for I am not being so---its all the truth. I have only touched the woes of the coal mining industry. I could write and say volumes if anyone is genuinely interested. I am

Yours very truly,

Charles N. Farmer

Charles N. Farmer,
Secretary & Treasurer,
Maverick Mining Corporation

HARMAN MINING CORPORATION
MINERS AND SHIPPERS OF THE FAMOUS DICTATOR COAL

SALES AGENT
SOVEREIGN POCAHONTAS COMPANY
P.O. BOX 287
BLUEFIELD, W. VA. 24701

ADDRESS ALL
COMMUNICATIONS TO GENERAL OFFICE
HARMAN, VIRGINIA 24618

MINES AND SHIPPING POINT
HARMAN, VIRGINIA

Harman, Virginia 24618
August 28, 1981

Honorable John Warner
United States Senate
Washington, D.C.

Dear Sir:

Since passage of the 1977 Surface Mining Act, a heavy and sometimes overwhelming burden has been placed on large and small coal operators. Because of the Act, many operators in Southwest Virginia have been forced out of business because of the over-strigent regulations. These regulations have hurt deep mine operators as well as strip operators. The regulations were designed to cover the whole U.S. Coal Industry without common sense used to compensate for different mining conditions encountered in individual states.

In Virginia, tens of million tons of coal have been marked off the reserve maps because it is no longer feasible to mine with the AOC provision of the Act. In the mountainous country, flat land is at a premimum. I agree that the overburden should not just be pushed over the hill haphazardly, but some workable solution needs to be found for this problem. Because millions of tons of coal is being left unmined and precious flat land is being covered back up over the landowner's objections just because it is the law.

Another major provision of the Act and potentially the most costly and wasteful of all, is the surface and groundwater provisions. In the mountainous terrain of Southwest Virginia, the large majority of mining operations are located high up on the mountainsides. It is utterly useless in having to drill ground water monitoring wells high up on the mountain when these wells will not tell anything about the drinking water of residents living 800 to 1000 feet (vertically) below the mining operation. These wells can cost up to one thousand dollars (1,000.00) each. Also, pond design size for these small minesites can enlarge these areas to twice their original area. Ponds that have to be designed to Probable Maximum Precipitation (PMP) standards are out of the question because everything in the area will be wiped out if 24 inches of rain falls in six hours. Even the 100 year/ 24 hour storm design is not realistic except in large operations.

Topography in Southwest Virginia is a severly limiting factor in location and size of minesites. It is not realistic to build a pond that is half as big as the minesite to control surface drainage just because the regulations are too strict. Almost all drainage on less than two acre sites can be adequately controlled with much smaller ponds. Many of the deep mines will not be able to comply with the requirements of the Permenant Program because they have been in existence for many years and it would cost too much to bring these minesites into compliance. Therefore, more coal reserves would be lost. If money is not the limiting factor at all sites, then topography would severly limit many others in relation to building more and large ponds, ditches, ect.

Haulroads in this area are another major concern of the operstors. At least 75% of the mines could not comply with OSM design specifications and grade requirements most of all. This area is too steep to meet these strict requirements while the operators have made out satisfactorly with present haulroads.

Mining operations can be regulated by up to nine agencies of the state and federal government. This is entirely too much of a burden on the operators and there exists overlapping regulations. The states should have control of reclamation because they are more aware of the different mining conditions encountered and can bring about workable solutions.

At our particular company, since the Act became law, we have lost millions of tons of recoverable coal because contour mining is too expensive. Also, we have drilled many wells that turned up dry when we knew beforehand that this would happen. We drilled them because the regulatory agency said that we had to do it. Also, pond design size has caused additional land to be disturbed when the pond already in place was adequate but they could not be brought up to OSM standards because of the topography and cost. This provision alone would put many mines out of business.

As a Engineer, I believe in a good sound reclamation program but there has to be amendments to the Act so that some middle ground can be reached to achieve a workable program. Any help that you may be will be greatly appreciated.

Sincerely;

Patrick S. Artrip

Patrick S. Artrip E.I.T.
Assistant to Chief Engineer
Harman Mining Corporation

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Harman, Virginia 24618
August 28, 1981

Honorable John Warner
United States Senate
Washington, D.C.

Dear Sir:

My name is Gary Christian. I am contract mine superintendent for Harman Mining Corporation.

In September 1980, we recieved an O.S.M. violation on drainage control at the Clintwood Dock. Due to this violation five ponds had to be built. The area where we are located is so small that we had to disturb additional area in order to construct these ponds. One pond had to be built in order to take care of the drainage from rainfall on our Clintwood load track. In two of these ponds the bottom had to be concreated because of the topography of the area the ground was too soft to maintain these ponds as per O.S.M. regulation. Additional area had to be disturbed by placing cribbing and fill material in order to build one pond. For two weeks during this time we only maintained 60% production because we had to quit periodically producing coal in order to disturb land and vegetation because of O.S.M. regulations.

All ponds had to be equipped with risers, filter cloths, overflow pipes and bermed with gravel. All disturbed area had to be covered with gravel in order to filter rainfall. This is only one example of the astronomical cost and loss of production time, because of O.S.M. regulations.

We as coal producers can not continue to stay in operation unless some change is immediate forthcoming concerning overlapping of Federal and State regulations. With nine federal and state regulatory agencies to contend with, when does one have time to produce coal?

As each day goes by energy is more in demand. We cannot meet America's need with conditions such as they are at the present time. We can not as American citizens of today let the American citzen's of tomorrow know that we let them down.

Sincerely;

Gary Christian

Gary Christian, Contract Mine Supt.
Harman Mining Corporation

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MINES AND SHIPPING POINT
HARMAN, VIRGINIA

August 28, 1981

Honorable John W. Warner
United States Senate
Washington, D. C.

Dear Senator Warner:

The 1977 Surface Mine Law has created many unnecessary problems and expense for the coal industry. I will attempt to cover some of the areas that should be considered in any forthcoming Amendments to the Act.

Requirements for "Designed" ponds are based on possible maximum precipitation (P.M.P.) which in this area is estimated at 24.5 inches of rainfall in six hours. The 1977 flood was only 8 inches of rain in 36 hours. How many Dams constructed by the Corp of Engineers are so designed?

Several small truck mines of less than two acres are enlarged to three and four acres of disturbed surface to comply with pond regulations.

The haul roads to many of our truck mines have been in use for many years and were constructed under Topography and Property limitations that makes it impossible to change to comply with O.S.M. regulations.

Minor violations of the Law are assessed as much as $4500.00 with little or no relief for good faith or quick compliance.

To comply with O.S.M. Regulations to start a small truck mine producing 100 to 150 tons per day, it is estimated that the compliance cost alone would be more than $75,000.00.

Also, it should be noted that in some mine construction sites we are subject to inspection from the following Agencies:

1. Office of Surface Mining
2. Division of Mine Land Reclamation
3. Division of Mines and Quarries
4. Mine Health and Safety Association

Honorable John W. Warner
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5. State Water Control Board
6. State Department of Health
7. County Health Department
8. County Waste Department Inspector
9. The State Department of Fish and Game

I feel that we are over-regulated and will appreciate any affort on your part to alleviate the situation.

Yours very truly,

Paul Hurley

Paul Hurley,
Vice President-Operations

PH:h

August 28, 1981

Honorable John Warner
United States Senate
Washington, D.C.

Dear Sir;

I am Irving Stiltner. I am a operator of O.K. Coal Co. No.2 mine located on Deel Fork of Bull Creek at Harman, Virginia. We are adjacent to a public road that has been in use for fifty-five years or more which is being used as a haul road.

First this deep mine site is considerably less than two acres and was assumed to be exempt from the O.S.M. act but this did not stop O.S.M. influence from a barrage of harassment and threats that resulted in the building of sediment ponds, grass seeding, ditches ect, that added nothing that would help in reclamation that could not be accomplished by realistic means with a realistic financial burden. Is this an example of the competence of the Regulatory Authority? Am I to be forced out of business as so many of my fellow opeators have been? We are spyed upon by nine different agencies of federal and state control. Have you sir, yet to see any of these agencies agree on anything? Who is the boss? Whom do we believe?

I agree as so many of my fellow operators for a need of a workable solution to the reclamation problem. We believe in reclamation but not reclamation in the form of being harassed, and ordered to comply with regulations that are absolutly preposterous.

Sincerely;

Ervin Stiltner
Irving Stiltner, Operator
O.K. Coal Co. No. 2 Mine

United States Department of the Interior
OFFICE OF SURFACE MINING
Reclamation and Enforcement
WASHINGTON, D.C. 20240

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BOARD ON MINERAL & ENERGY RESOURCES
RECEIVED
MAY 18 1979

Dr. Allen V. Kneese, Chairman
Board on Mineral and Energy Resources
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

Dear Dr. Kneese:

With the development of interim and permanent environmental performance standards by the Office of Surface Mining pursuant to charges delegated through P.L. 95-87, the Surface Coal Mine Reclamation and Enforcement Act of 1977, considerable controversy has arisen regarding the issuance of regulations governing the disposal of excess spoil at surface and underground coal mining operations. The Office of Surface Mining desires to pursue the possibly that the Academy might entertain a request to conduct a review of the technologies and philosophies regarding the disposal of excess spoil in an engineering and environmental sound manner.

What is excess spoil? Excess spoil is overburden material which is not returned to the mined area but rather deposited upon land surfaces which would not normally be affected by the mining operation. Secondly, why should OSM develop regulations when the Corps of Engineers (CE) and Mine Safety and Health Administration (MSHA) has already developed disposal criteria? Both of these agencies are required to review and concur with any regulation promulgated by OSM. OSM's interest stems from the fact that our concern over structural integrity of the structure spans a much broader and much longer period of time. For example, MSHA's responsibility is centered on the safety of only the mine worker and that responsibility evaporates when the disposal site or the associated mine is abandoned. OSM's concern regarding spoil stability is essentially forever and this concern involved both the safety of the general public and the onsite and offsite environmental resources.

In view of this responsibility and in view of the controversy regarding the disposal of excess spoil and established disposal requirements OSM believes that a review on a nationwide basis of the existing engineering practices, management philosophies and environmental concerns is mandatory.

The following discussion outlines the general provisions which OSM would like to pursue:

Objective 1: Conduct an indepth review of engineering practices and physiographic/environmental conditions impacting the disposal of excess spoil from surface and underground coal mining operations throughout the United States.

The major, but not all inclusive, elements of disposal include:

1. Difference in physiography. The ground slope of a disposal site influences the preciseness to which engineering practices must be observed. Disposal of material on relatively flat terrain would be thought to be less critical than disposal in mountainous regions.

2. Difference in rock/soil materials. The rock/soil type (stratigraphic characteristics) at the mine site and the durability and integrity of that material has an influence on the selection of appropriate disposal and placement practices to ensure stability. The geological conditions both stratigraphically and structurally will dictate site preparation requirements.

3. Differences in construction practices. Construction philosophy is possibly the most controversy issue surrounding excess spoil disposal. Questions which arise concern: disposal as a head-of-hollow, valley or flat land fill; necessity of establishing cookbook guidelines or allowing greater flexibility; end-dumping versus placement; requirement for specific lift thicknesses and prescribed static factors of safety.

4. Differences for handling surface and ground waters. What methods and techniques for the handling of ground water beneath the disposal site should be considered or required? What influence will ground water have on stability? The intensity of the controvery centered on the movement of surface water through, across or around the disposal site. The method of disposal construction determines whether surface water will be permitted to flow through a placed rock core drain or will be diverted away from the site to lateral diversion structures.

Objective 2: Once decisions regarding the issues surrounding the disposal of excess spoil are satisfied, an evaluation of rationale for promulgating performance standards is requested. When an agency is mandated, the responsibility for insuring the structural and environmental integrity of a specific phase of mining by legislation, how should performance standards or regulations be written? Should these standards or regulations be written as general guidelines offering guidance to issues which should be considered or should they be engineering specification in "cookbook style?" Or thirdly, is there an optimum combination of both options to insure satisfying the enacted legislation.

The resolution to this question would currently impact 5 areas of the permanent regulatory program published by OSM on March 13, 1979. These areas include: 816.46 - Hydrologic balance: Sedimentation Ponds, 816.71-74 - Disposal of excess spoil, 816.81-85 - Coal processing waste banks, 816.91-93 - Coal processing waste, 816.150-176 - Roads. These specific citations serve as a guideline, specific regulations could be incorporated in practically every proposed standard.

OSM would desire to complete this request within one year following the effective date of contract.

Sincerely,

David R. Maneval, Ph.D.
Assistant Director
Technical Servics and Research

NATIONAL RESEARCH COUNCIL

OFFICE OF THE CHAIRMAN
2101 CONSTITUTION AVENUE
WASHINGTON, D.C. 20418

August 26, 1981

The Honorable James G. Watt
Secretary of the Interior
Washington, DC 20240

Dear Mr. Secretary:

I am pleased to transmit herewith a report prepared for the Office of Surface Mining (OSM) entitled Disposal of Excess Spoil from Coal Mining and the Surface Mining Control and Reclamation Act of 1977. Aware of the timeliness of this topic, the Committee responsible for the report accelerated its schedule so that the results of its study could be made available now rather than in November, the contract delivery date. We hope you will find the views of the Academy on an alternative regulatory approach useful in relation to the current review of the OSM regulatory program.

The report reviews engineering practices and physiographic and environmental conditions that have an impact on excess spoil disposal from surface and underground coal mining and analyzes the regulatory approach adopted by OSM for such disposal and for other environmental protection practices. An assessment is also made whether such regulations should be in the form of specific rigid design-standards regulating the practices required of coal operators or whether more general performance-standards, specification of final results to be achieved, is more appropriate.

On the basis of its findings, CODES recommends that the OSM regulatory program for environmental protection standards, promulgated under the Surface Mining Control and Reclamation Act of 1977, adopt a performance or goal-oriented approach with certain minimum mandatory performance standards and non-mandatory guidelines. The report also recommends the establishment of field-oriented technical assistance units, regional guidelines that consider site-specific conditions to implement the performance standards, collection of appropriate baseline data, acquisition of regulatory staff having more appropriate training and experience, and the use of economic incentives to encourage operators to improve performance and adopt innovative practices.

The National Research Council is pleased to make the report available to the Congress, the Office of Surface Mining, other federal agencies, and the general public. We trust that the report will help to clarify important issues of public concern and contribute positively to the national discussion of the regulation of surface mining and reclamation activities.

Sincerely,

Frank Press

Frank Press
Chairman, National Research Council
President, National Academy of Sciences

cc: Dean Hunt
Lewis McNay